Southern Power & Industry

The Industrial and Power Journal of the South and Southwest

OCTOBER, 1960

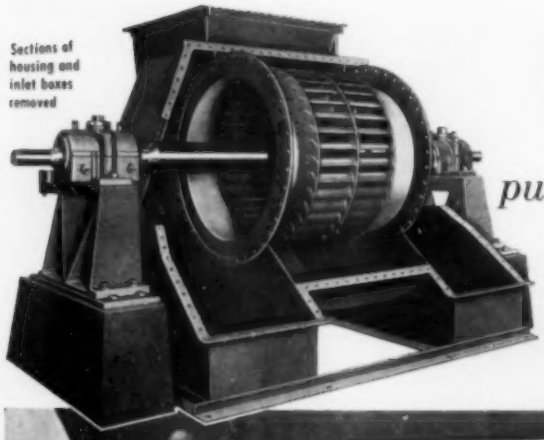
Better Production

Plans
For Improvement

Case Studies
See Page 3

SOUTHERN POWER & INDUSTRY is published monthly by W. R. C. Smith Publishing Co., Executive and Editorial Offices: 806 Peachtree St., N.E., Atlanta 8, Ga. Second-class postage paid at Charlotte, N. C. Subscription Rates: United States and Possessions, $1.50 per year or two years for $3.00; Foreign Countries, $10.00 per year.

Volume 78 Number 10



Sections of housing and inlet boxes removed

CLARAGE

puts wearing plates where they belong

on the face of the blades

DON'T SETTLE FOR LESS! Clarage makes sure you get *extra* service life on those punishing induced draft applications.

The Type DN Dynacurve fan, when equipped with wearing plates, has these abrasion-resisting steel plates welded to the *face* of the wheel blades. A distinguishing Clarage feature that guarantees you less maintenance, longer operation! But that's not all.

You get other advantages, and more, with Clarage Dynacurve fans: Minimum floor space and height requirements. Rugged wheel of 36 radially deep, aerodynamically curved blades and tapered rims. *Bolted* scroll liners for easy replacement. High efficiency over a wide performance range.

For *complete* information, contact our nearest office or write for Catalog 905.

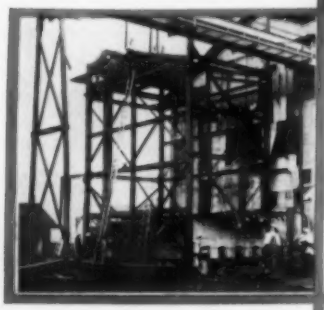
Dependable equipment for making air your servant

CLARAGE FAN COMPANY

Kalamazoo, Michigan

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

U. S. PLYWOOD solved its need for greater steam capacity *with a*



U. S. PLYWOOD CORPORATION
ROSEBURG, OREGON

one of the world's foremost manufacturers of Plywood

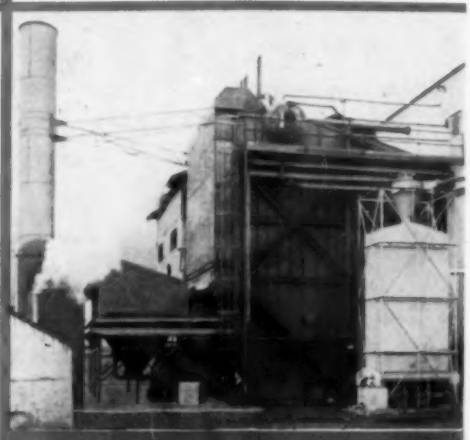
steam plant expansion and modernization designed by U. S. Plywood Corporation staff

— Mechanical Contractors —
BUMSTEAD-WOOLFORD CO.
Seattle—Portland—San Francisco—Los Angeles—Vancouver

KEELER MK

water tube steam generator

available in capacities from 12,000 to 200,000-lb stm/hr



THE PROBLEM...

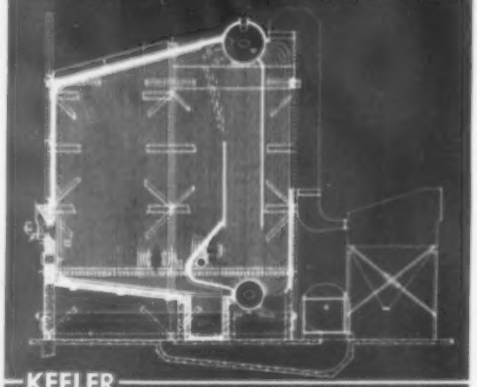
Sawmill, dry kiln and plywood manufacturing operations required greater, more flexible steam capacity to supply varying loads *(40,000 to 105,000 lbs/hr at 250 psi)*. Existing facility inadequate. Single unit must be suitable for firing plant's "hogged fuel" by-product.

THE SOLUTION...

An outdoor installation of a Keeler Type MK Water Tube Steam Generator—124,000 lbs/hr capacity, 275 lbs design pressure for solid fuel firing. The Keeler MK was erected in close quarters adjacent to old boiler house without interrupting plant's work schedule.

OPERATIONAL REPORT...

Keeler MK supplying entire steam requirement with capacity to spare. Functioning properly, operating economically, giving trouble-free performance. *Over-all requirements fully met with complete satisfaction.*



KEELER MK

All purpose cross drum water tube type steam generators provide high efficiency with any method of firing—for coal, oil, gas or waste fuel operation (or combinations), with ready convertibility.

There's a dependable Keeler Water Tube Steam Generator available for every requirement—from low cost package units to 80,000 lb/hr and field erected units up to 200,000 lbs stm/hr capacity... for all fuels, all types of firing. *Write for complete data...*

The Seal of Quality in Water Tube Steam Generators

Write For Bulletins

No. MK-1: Type MK Boilers
No. DK-2: Type DK Package Boilers
No. F-14: Type CP Boilers
No. M-2A: Type CPM Package Boilers

KEELER WATER TUBE Boilers

— ESTABLISHED 1864 —

E. KEELER COMPANY
West & Church Sts., Williamsport, Penna.
— OFFICES IN PRINCIPAL CITIES —
In Canada: Canadian Vickers, Ltd., Montreal, P. Q.

Southern Power & Industry

The Industrial and Power Journal of the South and Southwest

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Vol. 78
No. 10

OCTOBER, 1960

Better Production Issue

Address all correspondence to Editorial and Executive Offices: **SOUTHERN POWER & INDUSTRY, 806 PEACHTREE ST., N. E., ATLANTA 8, GA.** *Printed in U. S. A.*

Facts and Trends

October 1960

◆ MORE EFFICIENT LAMP — Westinghouse is now selling a fluorescent lamp, claimed to be the most efficient ever produced commercially.

The new lamp was designed to achieve one objective — maximum economy. It provides 15 per cent more light than standard 40-watt cool white lamps, and 36 per cent more than daylight type lamps, as the result of a new phosphor combination. Producing 3200 lumens, compared to 2800 for ordinary 40-watt fluorescent lamps, the new product also has excellent light maintenance characteristics.

◆ EPOXY-MICA STATOR FRAMES — The first Epoxi-Mica insulated coils for stator frames of high voltage generators have been manufactured and wound by Motor Coils Manufacturing Company.

The company claims the stator frames it has processed with its exclusive Epoxi-Mica system will provide longer generator life at lower cost. The generators processed are rated at 1563 kva, 13,800 volts, 360 rpm.

◆ BETTER STEEL —Average savings of four to six per cent in the weight of steel structures are promised by a new and higher yield point structural carbon steel now available — according to United States Steel Corporation.

The new steel conforms to specification A36-60T for rolled structural steel recently approved by the American Society for Testing Materials. The new specification is a significant step in terms of potential savings for the heavy construction field. Because A36 has a higher minimum yield point than present standard carbon structural steels, it should gain rapid acceptance and ultimately become the dominant steel used in structural applications.

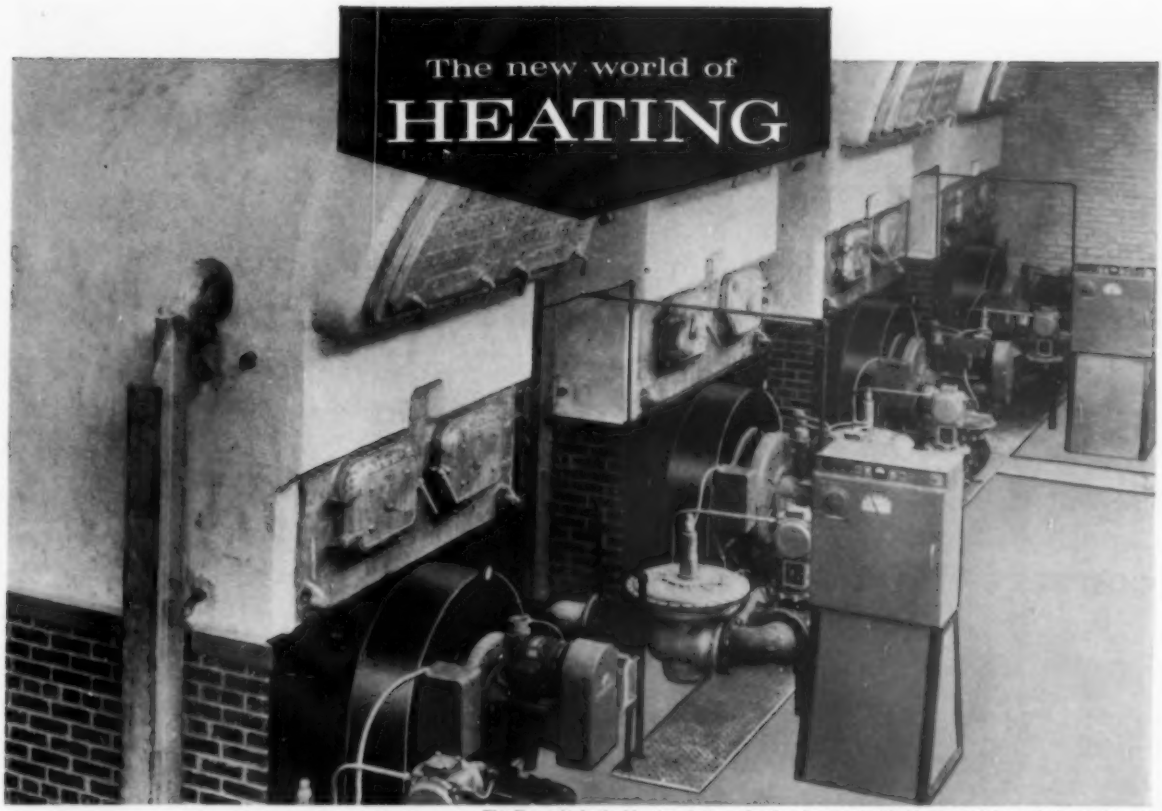
◆ DISTANT OBSERVATION — Developmental Engineering Corporation of Leesburg, Va., has been chosen by Cornell University as one of a four-firm team which will jointly produce the final design of the world's largest radio telescope.

The ionospheric radar probe, powerful enough to detect an object about three feet square at a distant of 22,000 miles, will improve astronomical measurement accuracy by at least ten times. The reflector portion of the radio telescope will have a diameter of 1,000 feet.

◆ ALUMINUM SUBSTATIONS — Southern California Edison Company's new all aluminum substation was described at a recent meeting of the American Institute of Electrical Engineers.

Company engineers reported that the cost savings possible with the use of aluminum for busses and conductors appear to be significant. The use of aluminum for structural racks appears to be satisfactory but the installed cost is not yet sufficiently competitive with steel to justify its extensive use on an economic basis.

(Continued on Page 8)



This Kansas high school heating plant uses four Iron Fireman dual-fuel burners with factory-built control panels.

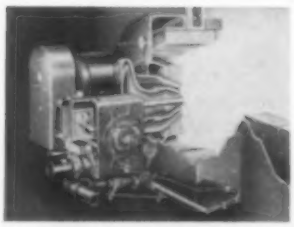
Add high efficiency firing *without boiler alteration*

Factory engineering replaces local "cut and try" firebox design

The Iron Fireman AirRing* dual-fuel burner (shown in the high school heating plant above) is a complete factory built package that is simply bolted to the boiler front.

The package includes both primary and secondary air systems, combustion safety controls, ignition and fuel systems for either one or two fuels, and factory engineered refractory combustion throat.

This compact unit not only reduces on-the-site construction, but achieves superior performance by supplementing local craftsmanship with experienced application engineering. Complete combustion is accomplished without flooding the firebox with excess air.



This cutaway shows how oil, gas and air are introduced into the combustion chamber through a single firing port. No checkered floor, firing arch or boiler pit. Flame is generated within a cone of air—no inefficient infusion of underfloor air.

*Trade-Mark

Mail coupon for full information and specifications.

IRON FIREMAN

HEATING AND AIR CONDITIONING
AIRCRAFT COMPONENTS AND EQUIPMENT
MISSILE AND AIRPLANE GYROSCOPES
ELECTRONIC EQUIPMENT
CONTROL INSTRUMENTS

Iron Fireman Mfg. Co., 3036 W. 160th St., Cleveland 11, Ohio
(In Canada, 80 Ward St., Toronto)

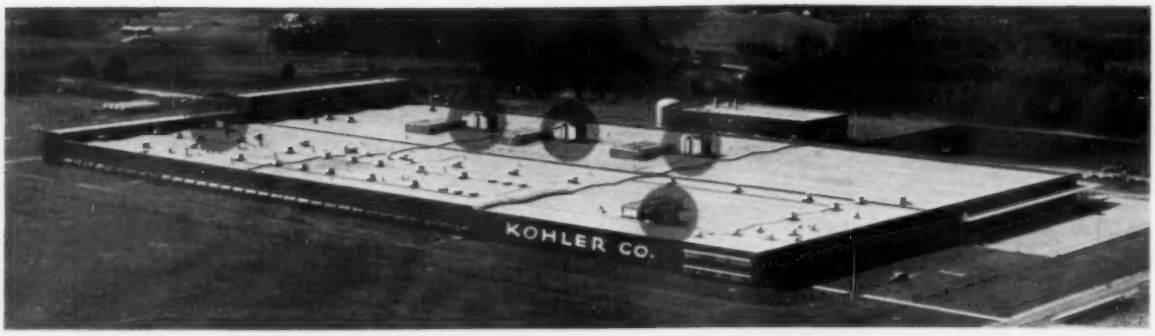
Please send complete technical description and specifications on Iron Fireman AirRing firing.

Name _____

Firm _____

Address _____

City _____ State or Prov. _____



These plants don't tolerate hot spots...

MARLEY COOLING TOWERS

convert them to profit spots

Major manufacturers who are building the new industrial south never permit water waste to reduce profits. In modern-to-the-minute, super-efficient facilities like those of the Kohler Co., producer of finest plumbing fixtures, and P. Lorillard Company, makers of Kent and Old Gold cigarettes, Marley cooling towers are always first choice for profitable water conservation.

At the home of Kent and Old Gold, Greensboro, N. C., two intermediate capacity Marley towers cool air conditioning equipment and a Marley industrial tower furnishes condensing water for power generating. At the Kohler pottery, Spartanburg, S. C., engineers specified five Marley towers; four serve zoned air conditioning and one cools a critical molding process.

For any type of service, of any capacity, there is a cooling tower in the comprehensive Marley line that will pinpoint the job. Since it saves 95% of gross water requirement, a Marley tower is an investment that quickly repays its low initial cost.

Get complete information from your Marley engineer (in 60 major cities) on potential saving a Marley tower can make in your plant. He will assist in surveying water waste from hot spots that can be changed to profit spots. Look for Marley in the yellow pages or write directly to

THE MARLEY COMPANY (MARLEY) **KANSAS CITY, MISSOURI**

"HOT SPOT" CHECK LIST

Are you wasting water in your plant because of—

1. **Air Conditioning?**
2. **Refrigeration?**
3. **Air compressors?**
4. **Molding presses?**
5. **Welding equipment?**
6. **Steam condensing?**
7. **Processing?**
8. **Furnace doors?**
9. **Quenching operations?**
10. **Any other plant service that requires 25 gpm or more?**

NEW HIGHLANDER

automatic boiler-burner plant

Choice of Hev-E-Oil, Hev-E-Duty gas or combination gas and oil burner

You can rely on this completely automatic unit for *all* heat or power applications. It is built for low pressure or high pressure use — burner to match for heavy oil, light oil, or combinations of gas/light or gas/heavy oil.

The new Highlander is a completely assembled boiler-burner plant (Scotch-type two-pass unit). This combination of boiler and burner brings out the best in operating efficiency and reliable performance. *Simple!* Just two flue passes. *Easy maintenance!* Boiler interior easily accessible. *Reliable!* Complete plant is carefully tested at the factory. *Guaranteed!* Each unit carries a certified rating for output. Entire unit bears Fire Underwriter's label. Write today for complete information — Dept. SPI-100.

HEART OF THE HIGHLANDER is the famous Industrial Combustion Burner. Shown is the HEV-E-OIL Burner especially engineered to make use of inexpensive heavy oils. Available from 5 to 150 gph. HEV-E-DUTY POWER GAS BURNERS and combination gas/oil burners in sizes from 720,000 to 21,000,000 Btu.

INDUSTRIAL COMBUSTION INC.

EXECUTIVE OFFICES: 4507 N. OAKLAND AVE., MILWAUKEE 11, WIS.

Facts and Trends (Continued)

◆ COLD CURRENT — Superconductivity was discovered in 1911 by H. K. Onnes at Leyden University. He found that the restivity of mercury underwent an abrupt transition to zero at 4.2 degrees K. A similar effect was found in 21 other metals and many alloys at near absolute zero temperature.

The study of cryogenics and cryotronics, long a laboratory oddity, is rapidly entering the realm of practicality, Mr. R. J. Allen of the Martin Company recently told those at an AIEE meeting. He said the biggest obstacle — creating and maintaining the environment — has already been lessened, and it will be removed with the imminent arrival of small closed loop cryostats (thermos-like containers) and other developments. The task then will be to exploit the unusual cryogenic phenomena, thereby bringing about improved size, weight, capability and reliability of electrical and electronic equipment.

◆ FLAT FLUORESCENTS — Rectangular fluorescent lamps, representing an entirely new concept in fluorescent lighting, will be marketed by the Westinghouse lamp division.

Westinghouse engineers have developed large, thin, rectangular glass plates no more than an inch and a half thick, which produce fluorescent light. The unusual lamps actually consist of a labyrinth or maze of passages sealed in a thin glass block. The arc or electric discharge travels this winding path through the glass block to produce, in effect, a large area source of light.

◆ NEW LAMINATE — A flame-retardant industrial laminated plastic, especially recommended for printed circuit and other electronic applications, is being announced for the first time by Synthane Corporation.

Grade FR-4 is a flame-retardant type glass-base laminated plastic with an epoxy resin binder. This newest material is the fourth in the recent series of flame-retardant plastics developed by Synthane, and is the third glass-base epoxy offered in recent years specifically for printed circuit and generally electronic component use.

◆ LONG DISTANCE CALCULATIONS — Two widely separated computers can now exchange information directly over the telephone — while each continues to print out the results of calculations.

This achievement was recently announced by International Business Machines Corporation with the introduction of its 1009 data transmission unit. The new product is designed to link the magnetic core memories of solid state computers over regular local or long distance telephone and telegraph lines. It enables two-way communication between computers at the rate of 150 numbers or letters a second.

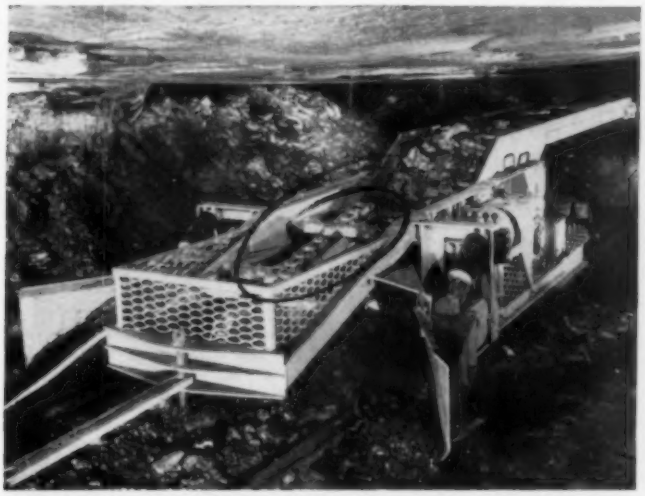
◆ ALUMINUM STRUCTURES — Commonwealth Edison Company has placed in service an electric power transmission line utilizing 44 towers fabricated from aluminum.

Installation of the aluminum structures followed full-scale tower tests, which determined that the aluminum designs met service requirements for the line. Structural sections, less than half the weight of steel, permit substantial economies in erection labor. Maintenance savings are anticipated because the aluminum structures are not expected to require painting.

(Continued on Page 12)

Jeffrey Mechanization serves every industry

WORLD'S LARGEST MUNICIPAL WATER FILTRATION PLANT—now being built in Chicago, will be equipped with 64 Jeffrey mixing units. Jeffrey is a leading supplier of equipment that mechanizes sewage and water treatment, for local governments and industry.



CHAIN KEEPS MATERIALS MOVING—Jeffrey chain was selected as part of the "beefing up" in design on Canton track cleaners to withstand extreme wear and stress. Jeffrey chains help various industries keep materials on the move. For conveying materials and transmitting power, it's a job for Jeffrey.

DOUBLES FOUNDRY OUTPUT—This new 400-foot-long Jeffrey Mold Conveyor, used in connection with semi-automatic molding machines, enabled this foundry to double capacity without expanding plant size.

Jeffrey serves every basic industry with *mechanization*... conveying and processing equipment, transmission and mining machinery. Sales-engineering service world-wide; standard products stocked by authorized distributors.

The Jeffrey Manufacturing Company, 898 North Fourth Street, Columbus 16, Ohio.

Mechanization for every basic industry

JEFFREY

PLANT PERSONNEL

Peter R. Beament, engineering assistant at Virginia Electric and Power Company's Chesterfield Power Station near Richmond, has been assigned to the Carolinas-Virginia Nuclear Power Associates, with headquarters at Charlotte, N. C. Mr. Beament joined Vepco in 1958 after graduation from Virginia Polytechnic Institute.

Recently appointed to Chemstrand Corporation's Dyeing and Finishing Service at Decatur, Alabama, are **Robert J. Robinson, Jr., Joseph C. Reno, J. P. Kimbrell, Jr.,** and **Larry L. Crooks.** Other positions in the company's Applications Research and Service Department have been filled by **Murphy O'Shields**—Textile Processing, and **James L. Dockery** — Acrilan Technical Sales Service.

Parker S. Anderson has been appointed development engineer at the Vulcan Plant of Reeves Brothers, Inc., in Buena Vista, Virginia.

Norborne C. Auld has been appointed superintendent of Oklahoma Gas and Electric Co.'s Eastern Division, with headquarters in Muskogee, following the retirement of Charles C. Yeakley. **J. B. Lynn** replaces Mr. Auld as Ada district manager. Mr. Auld has been with OG&E since 1925, and Mr. Lynn joined the company in 1927.

Appointment of **Thomas McClure** as a research chemical engineer on the staff of Charleston Rubber Company was made recently. Mr. McClure, a graduate of Clemson College, has specialized in phenolic plastics.

Joseph O. Evans, formerly assistant industrial relations manager of Bowaters Southern Paper Corporation at Calhoun, Tenn., has been promoted to personnel manager.

Norman D. McKenney, project manager for construction of VEPCO's hydroelectric dam and power station at Roanoke Rapids, N. C., has established field offices at the site. A construction engineer with Stone & Webster, Mr. McKenney has had extensive experience in heavy industry.

G. M. Boyd has been appointed manager of engineering for the Insulator Department of General Electric Company at Baltimore, Md. He succeeds **Howard A. Frey,** now general manager of the department.

Recently named manager of Continental Can Company's corrugated box plant in Tyler, Texas, is **Joseph W. Gary,** who has been with the company for nine years, and has been superintendent of the Tyler plant since it began operation in 1958. **R. Groner, Jr.,** is Southern district general manager of the Fibre Drum and Corrugated Box Division.

Charles E. K. Fox, formerly assistant works manager of Pangborn Corp., is now with the H. K. Porter Co.'s Disston Division as plant manager of its Danville, Virginia, works.

POWELL
HIGH PRESSURE VALVES

Performance makes the world of difference

Fig. 16031—Steel pressure seal "Y" globe valve for 600 pounds. Outside screw stem and yoke.

Fig. 11303—Steel pressure seal O.S. & Y. gate valve for 1500 pounds. 600, 900, 2500 pound valves can be furnished.

Fig. 6061WE—Steel Swing Check Valve for 600 lb. pressure. Bolted Flange Cap. Also available for pressures from 150 to 2500 pounds.

—and you can be sure of proven PERFORMANCE from Powell Valves—valves which, because of design, engineering, construction, are depended upon to control mounting pressures and temperatures in conventional and atomic power plants all over the world . . . and in modern industry. Performance is high—maintenance is low.

Gate, globe, angle, check, non-return and "Y" steel valves are made in all commercial sizes . . . for pressures to 2500 pounds and higher . . . for temperatures from sub-zero to super heat.

Powell Quality Valves are also available in bronze, iron, and a large list of corrosion-resistant alloys . . . to control the flow of water, oil, gas, corrosive fluids. Many are stocked for prompt delivery. Contact your nearest Powell Valve Distributor (there's one in every principal city) or write direct to The Wm. Powell Company.

Powell . . . world's largest family of valves

THE WM. POWELL COMPANY • DEPENDABLE VALVES SINCE 1846 • CINCINNATI 22, OHIO

Facts and Trends (Continued from Page 8)

◆ DO YOU DRIVE BY EAR? — You probably drive faster if your car is air conditioned. Engineers for The Goodyear Tire & Rubber Company say most motorists tend to gauge speeds as much by sound as by their speedometers. When windows are open, road noises and the rush of air emphasize speed, but when a car is air conditioned and the windows closed, the lack of sound gives the motorist a false feeling of security.

Speed not only can cost your life, it also wrecks your pocketbook. To dramatize the cost of speed, Goodyear tested tires of various manufacturers on Texas highways at two different speed ranges. One group of tires, run at between 65 and 70 mph, averaged 16,600 miles before treads wore smooth. A second group was run at 85 mph and went only 9,000 miles before losing the tread.

◆ BUSINESS INDICATOR — The volume of classified help-wanted advertising in United States newspapers is closely related to the business cycle, and particularly to labor market conditions, the National Industrial Conference Board reports in releasing an index of help-wanted ads to serve as a business indicator.

Regional indicators of business conditions are relatively scarce, and usually of a lower quality than statistics available for the nation as a whole. The NICB's index is based on the number of help-wanted ads published in the classified sections of leading newspapers, one in each of thirty-three cities representing thirty-three major labor market areas.

◆ HIGH VOLTAGE — With station structure erected and most of the apparatus installed, the North Station at General Electric's Project EHV (extra-high voltage) is approaching completion. The station and short section of the line are scheduled for fall energizing at 460 kv.

General Electric, with twelve cooperating companies, will invest 7.5 million dollars in the project which will operate at the 460 kv level in 1961 and in the 650 kv to 750 kv range after that.

◆ REPRINTS AVAILABLE—Write the editors of SPI for small quantities of the following at no charge:

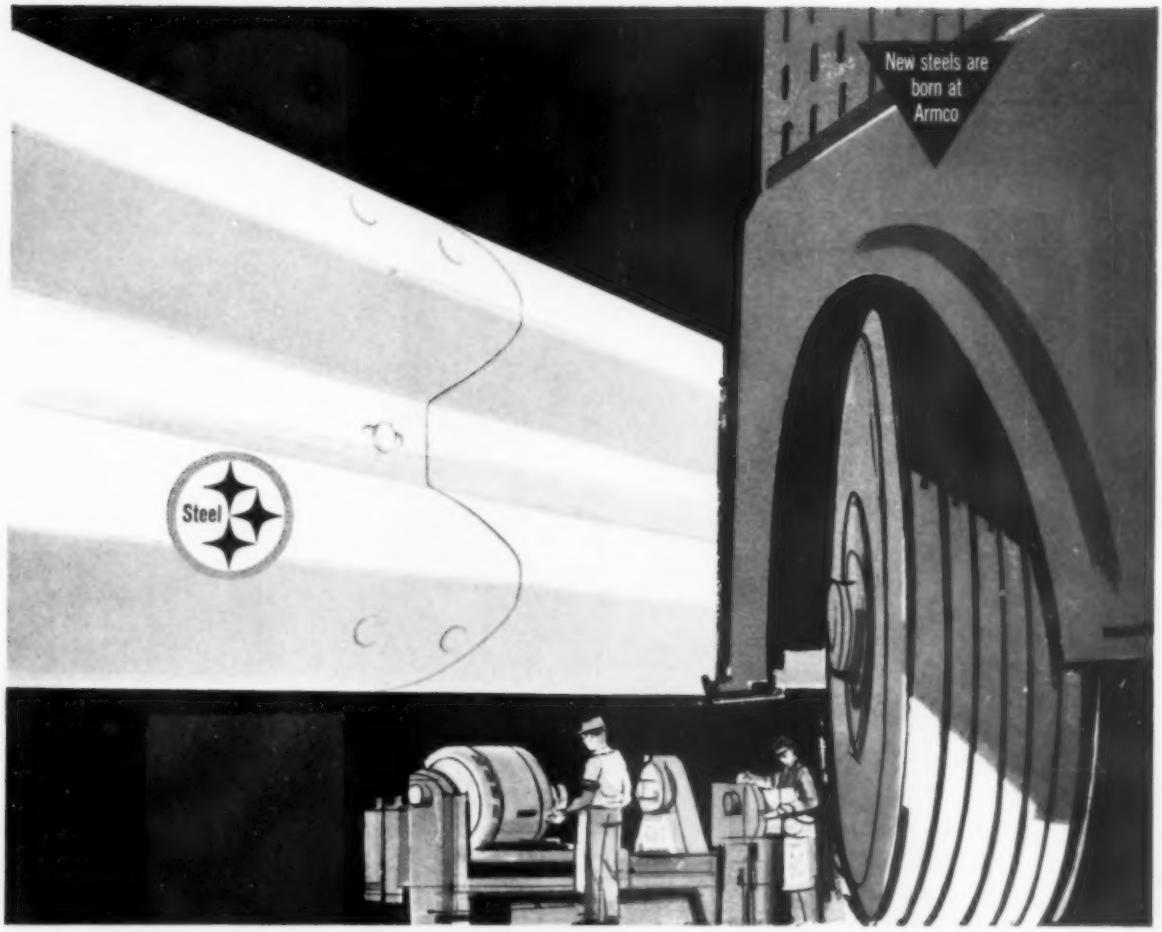
PAINTS & COATINGS — Buyer's Directory lists important suppliers and their representatives in the South and Southwest. Also lists reference literature (catalogs and bulletins) available from manufacturers to help solve protective coating problems.

HOW EPOXY CAN SERVE YOU—Two maintenance engineers of Dow Chemical Company's Texas Division. 4 pages. Tells exactly how 10 separate repair jobs were handled and describes several epoxy mixes that are good for maintenance jobs.

ORIFICE METER INSTALLATIONS—By W. H. Matthews, Supervisor of Instrument & Electrical Design, Chemstrand Corp., Pensacola, Fla. 8 pages. Tells what the plant man needs to know about installation to get accurate, dependable service.

INSPECTION REPORTS—By S. L. Terry, Southwestern Public Service Co. 8 pages. Last call on this one, the supply is running low. Tells how the station chemist can maintain information on the condition of boilers, cooling towers, condensers, heat exchangers, tanks and softeners. Actual inspection sheets presented.

Write the editors for additional information on any of the above items.
SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 8, Ga.



ANNOUNCING A NEW GUARDRAIL MADE ESPECIALLY FOR YOUR PLANT TRAFFIC

New Light-Gage Armco Guardrail Is Easier to Handle, Easier to Install

Now you can get a special new Armco FLEX-BEAM® Guardrail for off-highway installations. Made of 16-gage galvanized steel, it weighs approximately 40 per cent less than highway-type FLEX-BEAM. The new, simplified splice requires only four bolts.

All in all, this new Armco Guardrail is lighter, easier to handle, easier to install. For the first time it provides the means for protection of plant property, parking lots, plant entrances, expensive machines and other key equipment, with a product especially made for off-highway service. You buy less steel to do the job. It's maintenance-free, too. This new light-weight Armco FLEX-BEAM is protected from rust by a durable hot-dip zinc coating.

Get Details and Prices from your Armco Sales Engineer

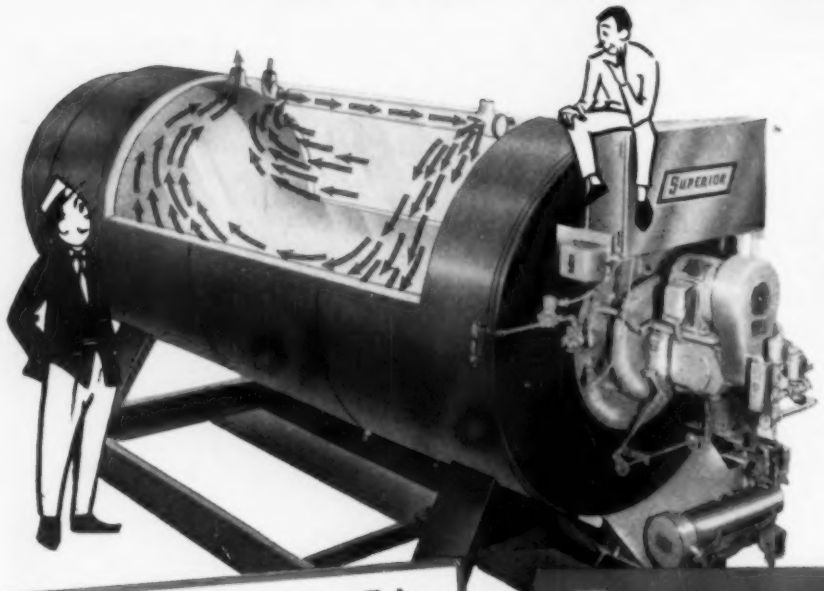
For full information write us. We'll arrange for the Armco Sales Engineer near you to provide the data you need. Armco Drainage & Metal Products, Inc., P.O. Box 1343, Atlanta 1, Georgia.

ARMCO DRAINAGE & METAL PRODUCTS

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company • The Armco International Corporation • Union Wire Rope Corporation

look what's happened to hot water boilers!



No, we're not making them with windows . . . we did that in the illustration to show you our NEW Venturi-action Mixing Tube which is the talk of the industry.

Venturi-Action Mixing Tube
plays a triple role:

1 It starts by mixing entrained water from the boiler with water entering the boiler.

2 Traveling through the tube, the temperature is further modified by the surrounding water.

3 Jet action at the end of the tube directs flow downward and outward against the outer confines of the shell, providing a circulation pattern unequalled in any other hot water boiler.

SUPERIOR "TYPE CC"

Simple as it is, the importance of this NEW Venturi-action Mixing Tube can hardly be over-emphasized; for hot water boilers in many types of installations are subjected to rapid and extreme changes of water temperature. When the distribution of cool water is not completely equalized, the resulting expansion and contraction of the boiler causes stresses and strains which have become known as Thermal Shock.

No hot water boiler can be made to withstand severe and repeated Thermal Shock . . . but this new Superior Boiler is designed to reduce it to a minimum.

Available in sizes to 600 BHP, Superior's Hot Water Boiler is the answer to trouble-free hot water heating.

For details of Superior's Hot Water Boilers in sizes to 350 BHP write for catalog CCW-15. For sizes from 400 to 600 BHP write for catalog CFW-15.

Specialists in PACKAGED BOILERS . . . exclusively

SUPERIOR COMBUSTION INDUSTRIES, INC.
TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.

SUPERIOR PACKAGED BOILERS

$ $ $
For Your Ideas

SP&I presents each month helpful features, ideas, methods and procedures — many plant-tested in Southern and Southwestern industrial, power and service plants.

Send your ideas, methods and short-cuts to Southern Power & Industry. Payment is made for suitable material — a photo or rough sketch will make your idea more valuable.

Articles from maintenance and production men in Southern and Southwestern plants are preferred. Material must not have appeared elsewhere nor been sent to another publication.

Southern Power & Industry
806 Peachtree St., N.E.
Atlanta 8, Georgia

INDUSTRY SPEAKS

Transportation Makes Cities Suitable for Industrial Plants

TRANSPORATION developments are making more cities suitable for new plant locations, according to Maurice Fulton, industrial development specialist.

"As recently as 10 years ago, hundreds of communities were ruled out early in planning simply because of their locations. If the city had inadequate airline or highway facilities, there was no point in putting a factory there."

Now, certain transportation factors have all but disappeared as problems in establishing a new plant. More than 88 per cent of all communities otherwise qualified for industrial development are within an hour's drive of an airport. And within seven years, there will be practically no potential plant locations more than three hours' drive away from a link with a big express highway system.

Mr. Fulton, partner in The Fantus Company, Chicago and New York plant location consultants, said, "The possibility of rockets to the moon and stars has made the world immeasurably larger, and at the same time, developments in transportation have made the United States much smaller."

With the enlargement of feeder airlines and the growing use of jets on trunk lines, management anywhere in the U. S. can visit a branch plant within hours. The feeder lines also provide suppliers with quick access to plants throughout the country, he pointed out. The regional airlines and the express highway system will complement each other. The highways will provide additional accessibility for passenger traffic and, of course, will offer convenience in moving freight from and to anywhere.

With transportation becoming less of a critical factor in locating plants, he concluded, other considerations have become relatively more important. These include quantity and quality of labor available locally, community resources, and tax structures.

South Turns Out Forty Per Cent of U. S. Paper and Board

THE SOUTH LAST YEAR produced 40 per cent of the nation's supply of paper and board with seven of the Southern states standing high among all states in the nation in output, according to the Atlanta field office of the U. S. Department of Commerce.

Nearly three-fourths of the South's total of 13,672,701 tons produced last year came from Alabama, Florida, Georgia, the Carolinas, Virginia and Louisiana where the output alone approximated 10,188,000 tons.

Florida stood second in the nation in production, its 1,955,561 tons being exceeded only by Wisconsin's 2,181,752. Georgia's 1,784,945 was the fourth greatest.

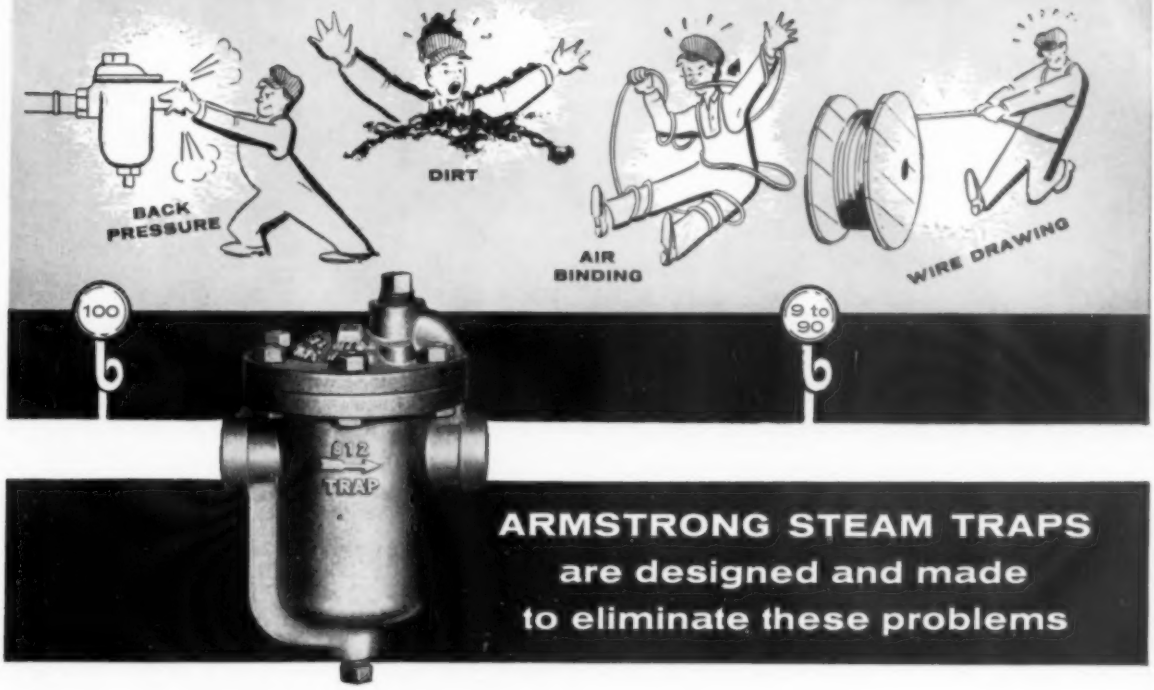
Most of the output in the South consisted of the board type, although the bulk of production in Alabama was paper, and in Louisiana it was about evenly divided between paper and board, Merrill C. Lofton, Commerce Department field manager said.

The figures, compiled by the Bureau of the Census, credited Southern manufacturers with a production in 1959 which was some million and a half tons greater than that of 1958 with all of the principal producing states in the region sharing in the gains.

Advancement of the South's business operations during the post-war years has been paralleled by a proportionate expansion in the region's paper and board production potentials, the Commerce Department said, with the result that production of that commodity in the Southern region has risen by 55 per cent with all of the principal producing states showing gains.

The 66 per cent advancement in production in the South in the past 10 years compared with a rise of only 12 per cent in the Northeast and 18 per cent in the North Central region, but a 94 per cent gain in the West.

Have you ever been troubled by any of these steam trap problems?



ARMSTRONG STEAM TRAPS are designed and made to eliminate these problems

BACK PRESSURE . . . Armstrong Traps operate on any back pressure—or vacuum, for that matter. As long as there is a pressure differential across the trap, it will close on steam and open for condensate. Even the high back pressure caused by blow through of one or more traps in the system will not disturb Armstrong Traps. Other than a reduction in capacity, Armstrong Traps are unaffected by back pressure.

DIRT . . . Armstrong Traps are not affected by ordinary dirt. When the trap opens condensate swirls down under the edge of the bucket and up through the discharge orifice. Dirt is kept in suspension and discharged along with the condensate. For very bad dirt conditions, Armstrong offers traps with integral strainers. These cost less than a trap plus a separate strainer.

AIR BINDING . . . Armstrong Traps cannot air bind. Air in the system passes through a vent in the top of the bucket. It collects in the top of the trap and is discharged with the condensate. There is no chance for it to stop the trap. For low pressure on-and-off units where large amounts of air accumulate while the steam is off, Armstrong offers open float and thermostatic air vent traps in a complete range of sizes.

WIRE DRAWING . . . Armstrong Traps are designed and made to resist wire drawing. The valve and seat are tough stainless steel. The valve opens and closes tightly with a fast action and is always water sealed. There is virtually no chance for grit or sediment to lodge in the valve, virtually no chance to create conditions that lead to wire drawing.

There's no need to accept any of these problems as "inevitable." Your local Armstrong Representative can show you how to end them all. Call him today or write direct.


860 Series for low pressure heating service.

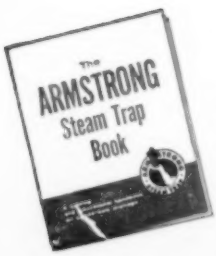

800 Series, side inlet, side outlet.


No. 801, side inlet, bottom outlet.


880 Series, integral strainer.


200 Series, bottom inlet, top outlet.


Forged Steel Series for high pressures, high temperatures.



The 48 page Armstrong Steam Trap Book tells how to correctly size, install and maintain steam traps for any pressure, any temperature, any load plus full catalog data on Armstrong Steam Traps. Ask for Catalog K.

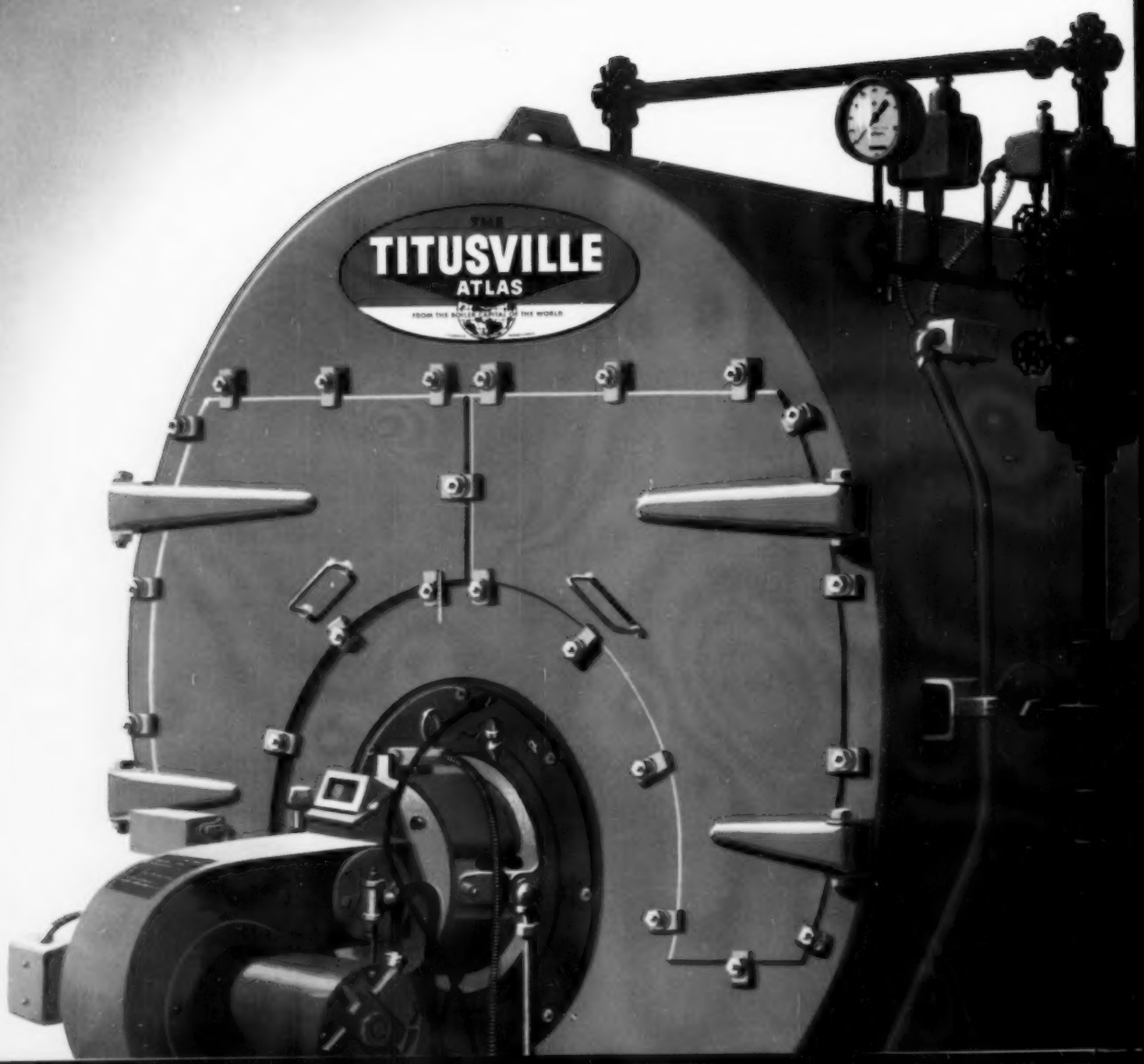
ARMSTRONG MACHINE WORKS

8065 Maple Street Three Rivers, Michigan

"See our Catalog in Sweet's Plant Engineering File"

BONUS

from the Boiler



POWER

Capital of the World . . .

THE TITUSVILLE-ATLAS

BONUS POWER means maintained high efficiency . . . longer life . . . less maintenance . . . more horsepower per total energy input. That's what you get when you install a complete TITUSVILLE-ATLAS unit, the only boiler with a patented wet back.

Wet-back design gives you maintained efficiency by eliminating back end refractories. *Result:* no down time for replacement.

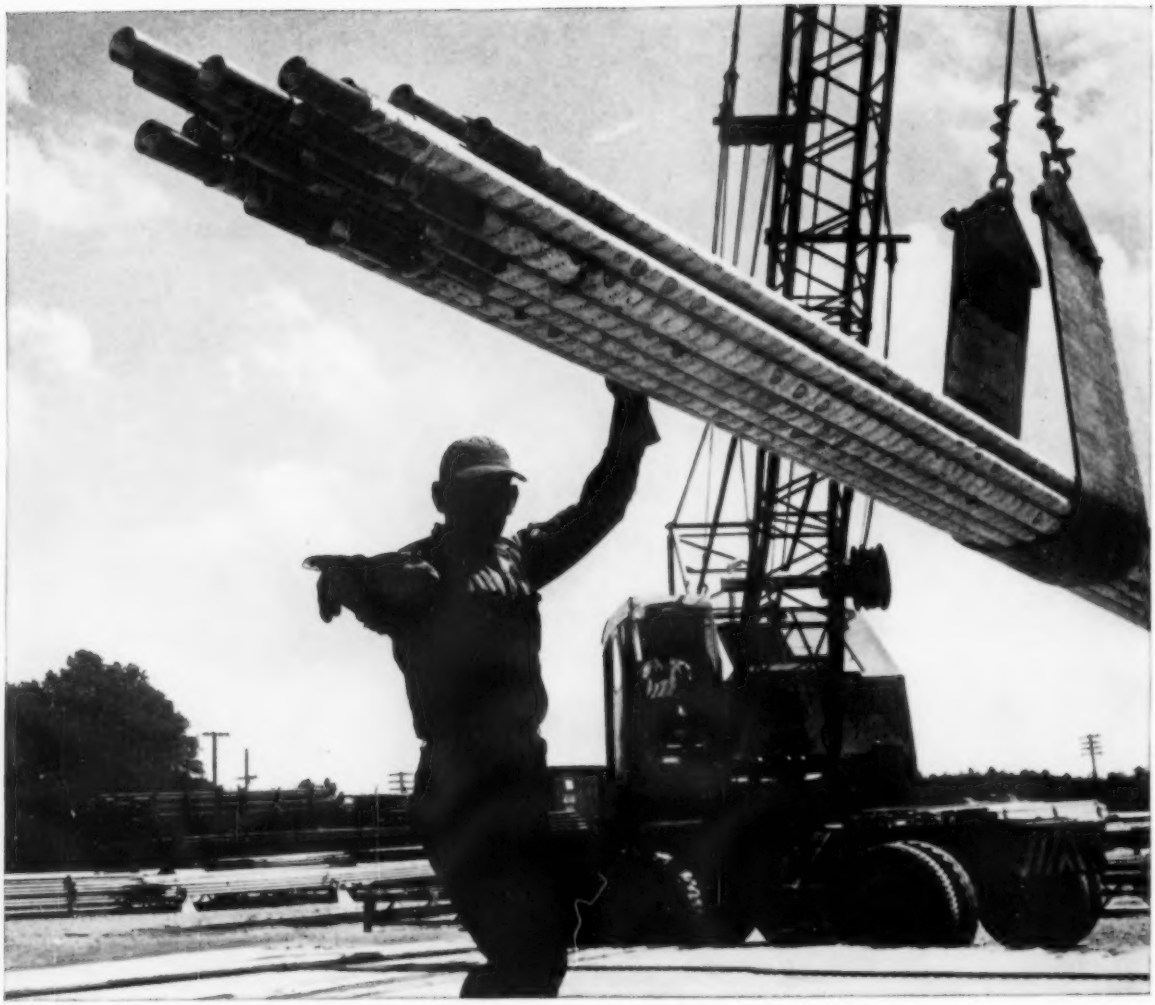
Larger furnace area permits reduced fan requirements. *Result:* lower operating costs. Get BONUS POWER. Specify TITUSVILLE-ATLAS.

THE TITUSVILLE IRON WORKS COMPANY

TITUSVILLE, PENNSYLVANIA

Division of Struthers Wells Corporation

VMA-8958



Call Southern in Atlanta... get pipe protection PLUS

What's the big reason to have your pipe coated and wrapped (or lined) at Southern Pipe Coating of Atlanta? It's the big "plus" you get in quality-control and speed of service.

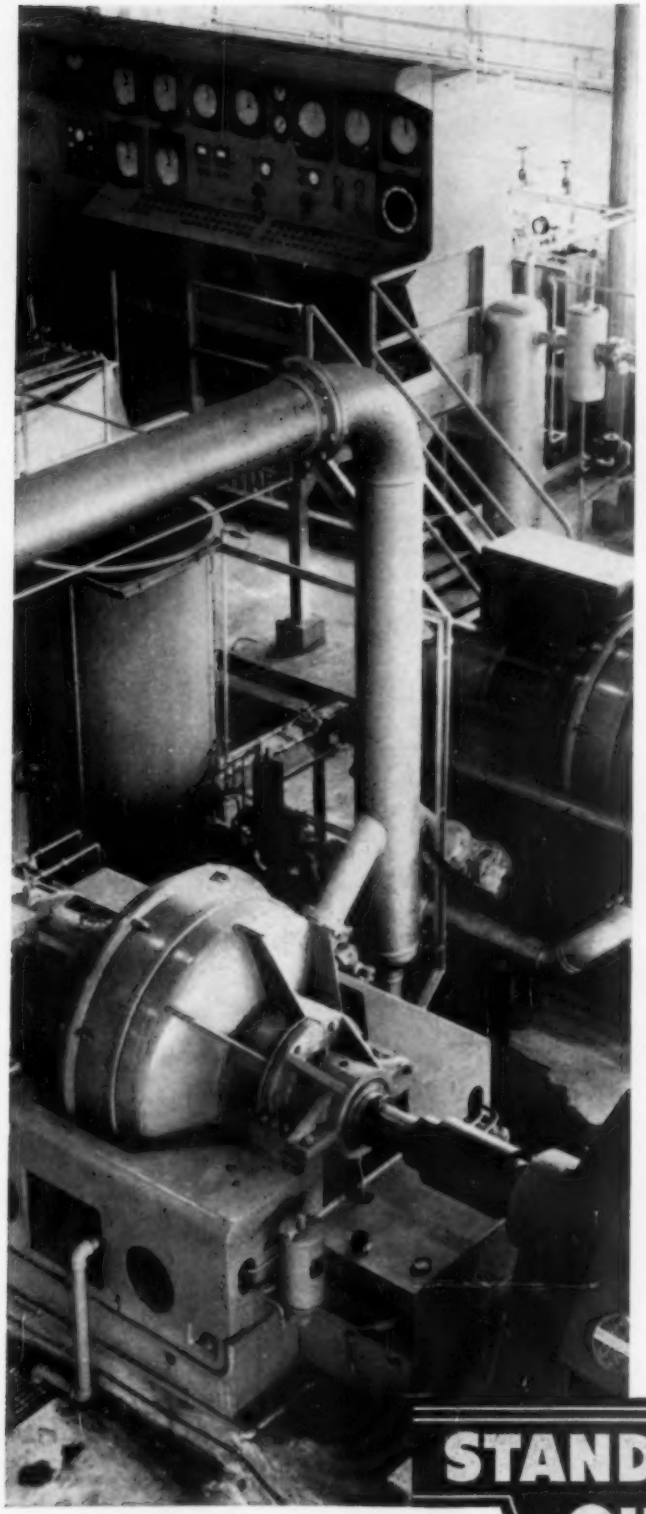
Southern's modern all-weather plant and production lines, backed by skilled personnel and continuous quality control, can process pipe up to 30" in diameter to your exact specifications. We can also handle special orders for coating and wrapping larger diameter pipe up to 80" in diameter, to the same high standards of quality pipe protection.

Our truck fleet assures prompt delivery, and we can closely coordinate stringing along passable roads to meet your work requirements. If you wish, we can store your bare or processed pipe in our 24-acre plant at no cost to you.

See for yourself the only plant of its type supplying the majority of coated and wrapped pipe in the South. We'll gladly make all the arrangements for your visit. Or, if you're in the area, please drop in.

Southern Pipe Coating Company

795 PEACHTREE STREET, N. E. ***ATLANTA, GA.***



experience has a cash value

In serving Southern industry with dependable lubricants for seventy-four years, our lubrication engineers have acquired experience that can be valuable to you. This experience is backed up by the combined facilities for testing and research behind Standard Oil lubricants that are unequaled.

Whatever your requirement may be — there's a Standard Oil lubricant designed to do your particular job with economy, dependability and efficiency.

STANDARD OIL LUBRICANTS

STANDARD OIL COMPANY
(KENTUCKY)

COMING IN DECEMBER
THERMAL INSULATIONS

Reference Guide and Buyer's Directory for the South-Southwest

Reference Guide and Buyer's Directory (included in SPI's regular December '60 Mechanical Engineering-Power Show Edition) will feature:

NEW PRODUCT BRIEFS & BULLETINS—asbestos, cork, felt, glass, wool, magnesia, mica, silica — fills, sheets, cements, blankets — for tanks, boilers, evaporators, piping, processing equipment, etc.

SALES ENGINEERS serving you in the Industrial South-Southwest — Directory type listings, including name, address, and phone numbers.

This is SPI's annual technical service aid in the **THERMAL INSULATION** field for 1960.

This edition (also featuring the Mechanical Engineering-Power Show) will be a real service to you and to 17,100 other Consulting-Engineering-Operating-Maintenance personnel in over 12,000 Southern & Southwestern industrial plants (manufacturing, process, utility and service).

it's for you!

Help for you on shipping matters is as close as your phone. Just call our sales and service representative near you—if your shipment is to, from or within the South.

THE SOUTHERN SR SERVES THE SOUTH

SOUTHERN RAILWAY SYSTEM

the SOUTH—SOUTHWEST

more power . . . more plants . . . more money

New Soaking Pits — Reynolds Metals Company, Sheffield, Alabama

New Soaking Pits for Reynolds Metals — Ala.

Fourteen new soaking pits capable of holding some 2,300 tons of aluminum ingots at temperatures up to 1150 F are now in use at the **Reynolds Metals Company** Alloys Plant at Sheffield, Alabama.

The cavernous gas-fired soaking pits can soften and homogenize aluminum ingots as long as 200 inches and weighing up to 34,000 pounds each. They were designed and built by the Rust Furnace Company to Reynolds specifications.

The pits are for use in readying the king-sized ingots for rolling into plate and sheet on "the world's largest" aluminum rolling hot line. The hot line is part of the major expansion now nearing completion at the big plant.

The pits "soak" the aluminum alloy ingots in carefully controlled heat which thoroughly homogenizes or blends the aluminum and alloying materials. After soaking for up to 48 hours, the ingots are moved to the 170-inch reversing mill which heads up the new hot line.

Inside dimensions of the four pits which can handle the 200-inch ingots are 19′ deep by 9′9″ and 21′4″. The 10 pits for the 160-inch ingots measure 15′8″ deep by 9′9″ by 21′4″ inside.

Electric Autolite's New Plant — Alabama

Ground was broken recently on the 80 acre site of **The Electric Autolite Company's** new electrical parts plant at Decatur, Alabama. Slated to be in production by the spring of 1961, investment in the new plant will be between $6,000,000 and $7,000,000.

Uranium Plant — Texas

A contract to construct the nation's 26th uranium ore processing plant near Falls City, Texas, has been signed by the Atomic Energy Commission and Susquehanna-Western, Inc., Denver, Colo. subsidiary of the Susquehanna Corporation, Chicago.

First uranium mill to be built in Texas, the new plant will cost approximately $2 million, and will have a rated capacity of 200 tons of ore per day. It will utilize a complex metallurgical recovery system to treat uranium-bearing ores chemically and produce the uranium concentrate known as "yellow cake" for sale to the A.E.C. It is estimated that the mill can be built in 10 months, and is expected to go into operation early in 1961.

Tampa Electric Plans Fourth Power Plant

Plans for a fourth power plant have been announced by **Tampa Electric Company.** Although actual construction plans have not been completed, the utility firm revealed that 150 acres of land approximately 10 miles south of Tampa. Florida. between Adamsville and Big Bend Road, on Hillsborough Bay will be the site of the plant.

The new power plant will be similar to Tampa Electric's Gannon Station at Black Point. It will be coal-fired and will have a deep water channel some 200 feet wide and 35 feet deep in order that coal can be brought in by ship. Rail unloading facilities will also be provided.

Tampa Electric officials said that preliminary engineering and dredging at the site would possibly start about five years in advance of the actual operating date.

Acquisition of the new plant site is part of the firm's long range construction plans. The utility announced earlier this year that plans are already laid that would see Tampa Electric's present facilities approximately doubled at a cost of $150,000,000 within the next five years.

Scheduled for completion by October of this year was the third unit at the firm's Gannon power plant. This unit, 175,000 kilowatts in capacity, is the largest generating unit on Tampa Electric's system. Two units of 130,000 kilowatts each are already in operation at Gannon, and the utility firm has announced that the major equipment for a fourth unit at Gannon, to be 190,000 kilowatts, is already on order. This unit is scheduled to be completed in 1963. Plans also call for additional units at Gannon prior to actual construction of the Company's fourth power plant.

(*Continued on page* 28)

How American Brake Shoe Maximates Production

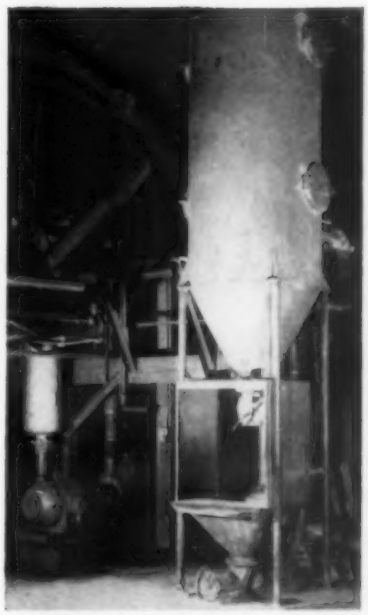
When the American Brake Shoe Company began an extensive modernization program at its New Castle, Delaware plant, one of the first steps management took to maximate production—that is achieve maximum output at less cost—was to install a Hoffman pneumatic conveying system for keeping bentonite, dextrin, silica flour and other materials *on the flow*. With a Hoffman exhauster furnishing the air as well as suction for the handling system, and use of components described here, the equipment not only simplified bulk conveying chores but paid its way in a few months by providing substantial production, material and labor savings.

MATERIAL INTAKE VALVE

Materials are introduced into the air stream through a unique nonclogging intake valve attached to the bottom of a hopper and flow smoothly through pipe lines to any one of six primary cyclone storage tanks more than 350' distant. Hoffman intake valves insure the uninterrupted flow of dry, powdery or granular materials through all types of vacuum conveying systems. Suitable for use with 2" through 6" pipelines, they are equipped with standard 8" flanges and can be easily attached to bins, hoppers, or dust collectors. Connected equipment is protected from exposure to the full suction of the system by a separate air inlet. The material handling rate can be adjusted while air is flowing. Thorough mixing insures smooth transit.

HINGE VALVE

Self-cleaning Hoffman hinge-type discharge valves are designed for air-tight closure against a head of material. The one-piece valve body is cast of gray iron with its rubber-faced disc and seat completely inside the casing. Lever linkage permits operation by means of chain or cable from a remote station. Provision can also be made for air or hydraulic cylinder actuation of the valve.



A portion of the Hoffco-Veyor system installed at the American Brake Shoe Co. plant in New Castle, Delaware.

ROTARY VALVE

Chain driven rotary discharge valves of cast semi-steel construction feed the material in controlled quantities. Designed for interchangeability of various types of fabricated and cast rotors, valves are equipped with torque limiting drive sprockets for protection against jamming and overloading. Equalizing connections permit attachment of bleed lines to vacuum or pressure source. Inspection of the interior can be made through an access port without disassembly of the valve.

PERISTALTIC VALVE

Controlled expansion and contraction of rubber diaphragms permit discharge in measured quantities. Since there are no internal moving parts, even coarse abrasives can be handled with minimum wear. Sheet rubber diaphragms are easily replaced whenever necessary.

COMPETITIVE ADVANTAGES

In handling quantities of dry, free-flowing powdery and granular materials such as sand, shot, chemicals, etc., Hoffco-veyor systems and components speed production—provide many genuine benefits and advantages which are reflected in higher profit margins. These include:

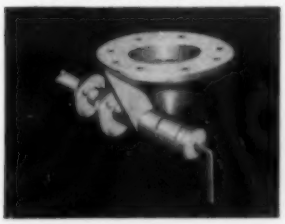
- flexibility
- cleanliness
- time saving
- lower initial cost
- easy installation
- material saving
- labor saving
- pay for themselves

FREE ENGINEERING SERVICE

If you have a materials handling problem, you can solve it with either a complete Hoffman system or any of its parts which may be purchased separately to fit your needs. Available equipment includes dependable centrifugal blowers/exhausters, cyclones, collectors, material intake, hinge, rotary, butterfly and peristaltic valves as well as filter bag collectors. We'll be glad to make a free engineering survey to determine how you can improve your manufacturing methods by maximating production with a really tight method of material handling. Send now for a free descriptive booklet. Please write:

Air Appliance Division
Dept. EM
U. S. Hoffman Machinery Corp.
103 Fourth Avenue
New York 3, New York

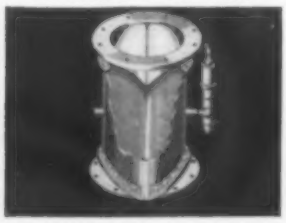
Material intake valve

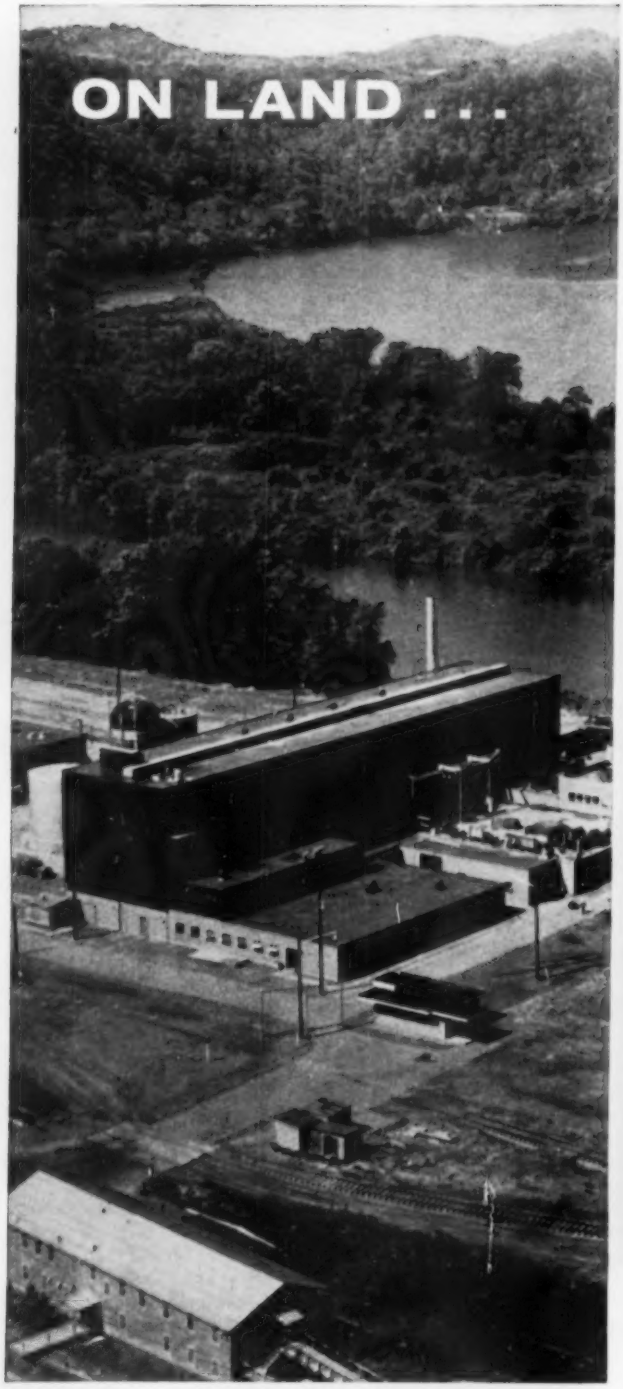


Hinge valve

Rotary discharge valve

Peristaltic rubber valve



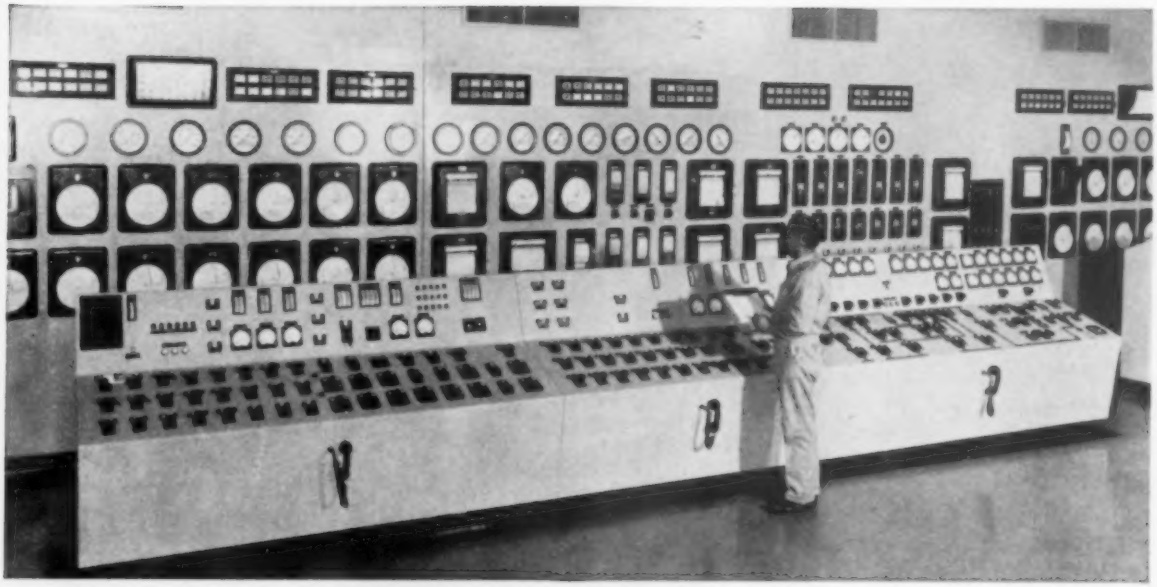


At the Shippingport Station, world's first full-scale atomic, electric power plant devoted exclusively to civilian use, Bailey instruments and controls help to secure full capacity and safety.

Typical of the modern U.S.-Flag tanker fleet using Bailey controls is the ESSO Gettysburg. You'll also find Bailey controls aboard Naval ships, cargo ships and lake steamers.

Bailey meters and controls in centralized control room at Tulsa Power Station, Public Service Company of Oklahoma. In steam-electric generating plants of this kind, Bailey has installed more combustion, feed water and steam temperature controls than have all other makers combined.

IT'S BAILEY...



for the latest and safest instruments and controls for nuclear and conventional power plants!

Many of the power plants of the future will have controls and instruments designed and built by Bailey. There are two reasons: Bailey's continuing research and development toward the latest equipment for industry's needs; Bailey's 40-year association with the hardware and economic requirements of the industry.

If you are planning new or improved power plant facilities, call on Bailey engineers to insure that your system will have the *proper balance both as to economics and needs . . . that there will not be the unnecessary expense of over-instrumentation or control . . . nor the duplication of equipment functions.*

Call on Bailey for primary sensing devices, indicators, loggers, control units, panels, data handling equipment, computers for performance analysis, and supervisory controls. You'll find designs ranging from conventional to the most sophisticated . . . mechanical, pneumatic, electric and electronic, including solid state.

There's a Bailey District Office or Resident Engineer close to you. Check your phone book, or write direct.

A142-2

BAILEY METERS

Instruments and controls for power and process

BAILEY METER COMPANY

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In Canada—Bailey Meter Company Limited, Montreal

Bowaters Carolina V. P.

T. C. Bannister, Jr. has been appointed a vice-president of **Bowaters Carolina Corp.**, Catawba, S. C.

Mr. Bannister, who will continue as general manager, has responsibility for day to day control of all existing and planned operating units at Catawba, including the sulphate

pulp mill; Bowater Board Company, a hardboard mill; and a printing paper mill scheduled for operation in mid-1962. He is also a director of Bowaters Carolina; Catawba Timber Company; and Bowaters Southern Paper Corporation, Calhoun, Tenn.

A native of Alabama, Mr. Bannister has had 21 years experience in the pulp and paper industry, having been associated with Crossett Paper Mill and Hollingsworth and Whitney Company before joining Bowaters in 1954. He has a B. S. degree from the University of Alabama.

Westinghouse Elects Georgia Board Member

The election of **Alfred W. Jones** of Sea Island, Ga., to the board of directors of the **Westinghouse Electric Corporation** was announced recently.

A leading figure in the industrial development of Georgia, Mr. Jones is vice-president and a director of the Seaboard Construction Company, a director of the Brunswick Pulp and Paper Company, and the First National Bank, all of Brunswick, Ga. He is also a director of the Georgia Kraft Company, with plants in Rome and Macon, Ga.; of Thompson Industries, Inc., which operates five metalworking plants in south Georgia; and of the First National Bank of Atlanta. He is president of the Talbott Corporation and a director of the Mead Corporation.

New Atlanta Plant for Morningstar-Paisley

Production of an extensive line of industrial adhesives has begun at the new **Morningstar-Paisley, Inc.,** plant in Atlanta, Ga. The new plant is also a warehousing and service facility for the company's other products, such as textile, paper and food starches; water soluble gums; polyvinyl acetate resins; and plastisols. A team of specialists in all fields where adhesives are used is on hand to assist with technical problems.

Initial annual capacity of the plant is set at 12,000,000 pounds of liquid adhesives based on vegetable, animal, casein, synthetic resin and latex materials. The adhesives are custom-formulated for packaging operations and the manufacture of bags, envelopes, paper products, footwear and wood products.

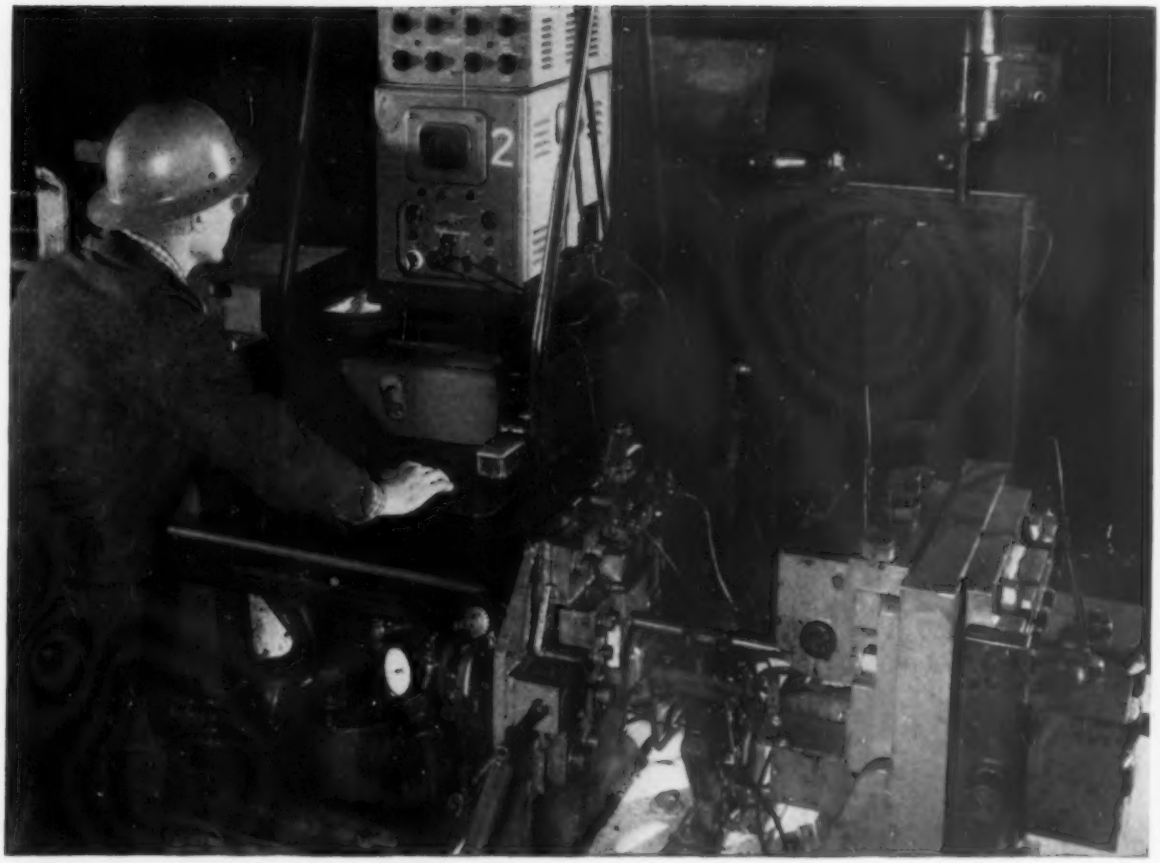
The new plant, located on Lake Mirror Drive in the Expressway Industrial Park, was built by the McDonough Construction Company of Atlanta, according to plans and specifications furnished by Company engineers. The building is fire-proof construction, brick, and steel, with air conditioning in laboratories and office areas. The two-acre site with railroad and truck sidings provides space to triple the present plant.

Plant personnel includes Lee Kritzer, Regional Manager, and Milton F. Lenz, Production Manager.

Noland Company to Build Warehouse — Decatur, Ala.

J. S. Stutts, manager of the **Decatur, Alabama,** branch of the **Noland Company,** signs a check for the purchase of a tract on which his company will build a new $200,000 combination warehouse, showroom and office. Standing behind him are Charles Parker and H. R. Summer of the Decatur Housing Authority, and Mayor Murray Dodd. The Noland Company, with branches in 36 Southeastern cities, is the nation's largest independent distributor of plumbing and heating equipment.

(Continued on page 32)



How to inspect electric welded tubing with ultrasonic sound waves

National Tube tests all USS National Electric-Resistance Welded Pressure Tubing with ultrasonic sound waves. As the tubing slides directly over a ground quartz crystal, electrical pulses are focused on the weld area. The crystal changes these pulses into ultrasonic vibrations which bounce off the the weld and reflect its strength or weakness. The vibrations are speared by the crystal, converted back into electrical energy, and floated across an oscilloscope screen.

If a bad weld is reflected, the electrical current dances wildly on the screen and triggers an alarm system. The crooked pattern is pen-recorded on a graph, a frog-voiced horn croaks loudly, and the tubing is squirted with black paint to mark the defect.

In case the ultrasonic unit breaks down, a red-faced dome light automatically flashes, revolves and winks at the weld inspector. This blushing signal tells him that the unit needs to be checked. It's added insurance that every length of pressure tubing is completely tested before it leaves the plant.

Our inspection techniques are rigid. But they help us develop a high quality product for use in applications such as boilers, heat exchangers, condensers, superheaters, economizers and other types of heat transfer equipment.

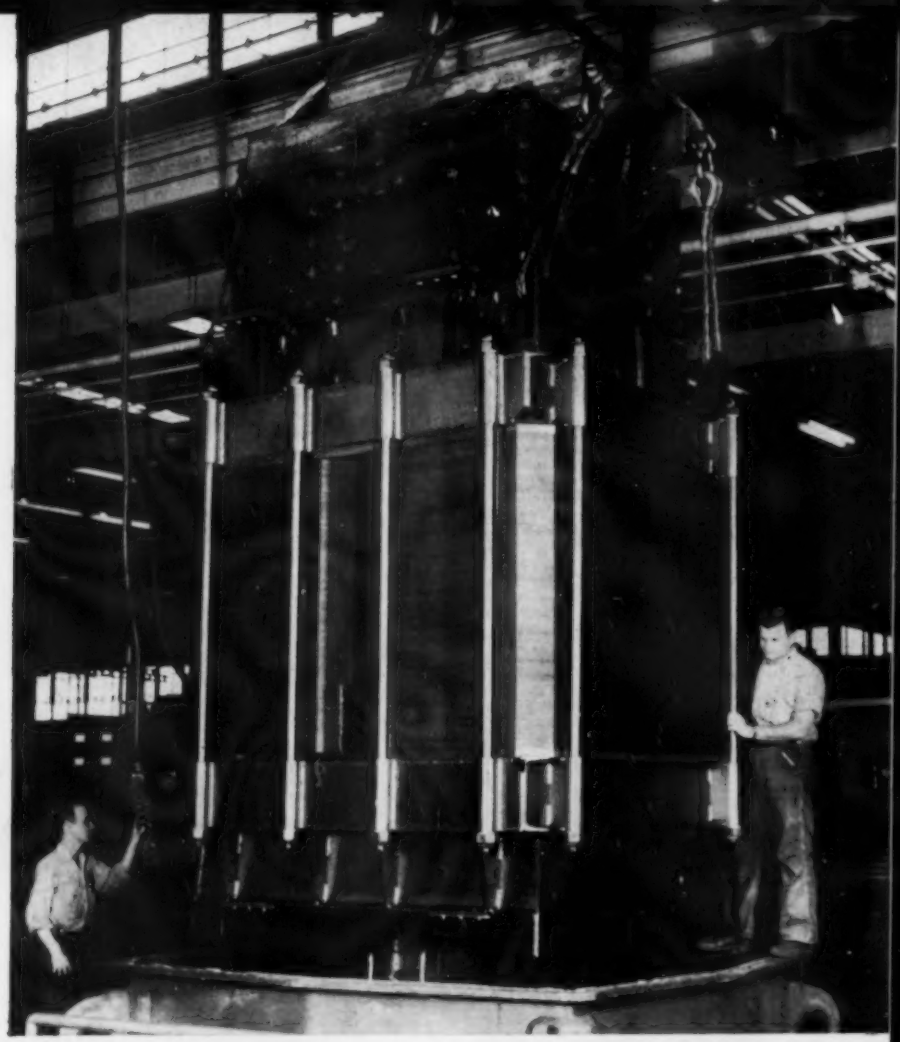
USS National Electric Welded Pressure Tubing is available in sizes ½" O.D. to 5½" O.D. inclusive, in walls from .035" to .250", and in lengths up to 44 feet. Consider USS National Electric Welded Tubing for your next installation. It's stocked by National Tube Distributors all over the country. Our trained Mill Service Force is also available for field consultation. Write National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS and National are registered trademarks

National Tube Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Supply Division
United States Steel Export Company, New York

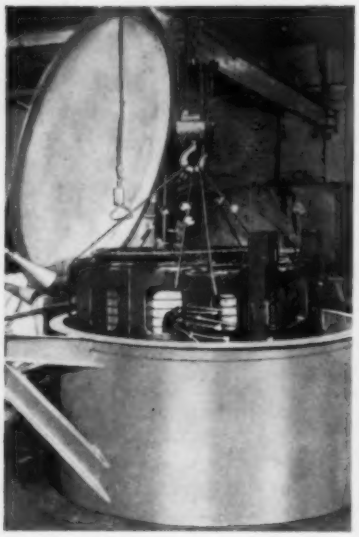
This mark tells you a product is made of modern, dependable Steel.



THIS POWER TRANSFORMER will have increased kva capacity, efficiency and reliability after complete modernization. Westinghouse Repair Plants will modernize both power and distribution transformers. Here, the uprated core and coil assembly is reinstalled in transformer tank.

MOTORS are rebuilt to rigid new-equipment standards. Improved coils and new insulations like Super COILIFE* are engineered to give long-life, reliable performance.

*Trade-Mark



LARGE ROTATING EQUIPMENT can be uprated by Westinghouse service. Repair techniques include application of exclusive Thermalastic® insulation that withstands moisture, dirt and other contaminants, greatly extends operating life of the windings.

SWITCHGEAR, CONTROLS AND STARTERS, damaged by fault, fire or flood, are completely revamped to assure positive performance. All component parts are carefully checked for re-use or, when necessary, replacement as determined by inspection and tests.

Westinghouse repair service builds years of new life into your equipment

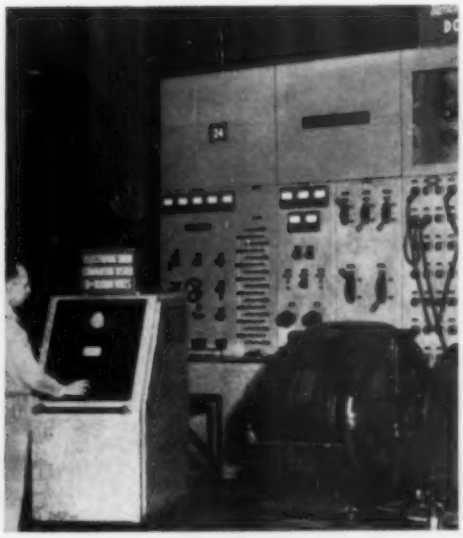
For fast, dependable, quality repair service, check your nearby Westinghouse Repair Plant. It's completely equipped to handle routine or troublesome jobs . . . and staffed by experts who excel at making equipment as good as new, electrically and mechanically. All repairs verified . . . and guaranteed!

Here is only a hint of the scope of Westinghouse repair service. For details, secure a free copy of "Modern Repair Craftsmanship" from your Westinghouse representative. Or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. You can be sure . . . if it's Westinghouse.

J-95217

Westinghouse

PRECISION MECHANICAL OPERATIONS assure top-notch equipment repairs. Facilities are available for cutting, drilling, shaping, milling, boring, welding, metalizing, turning and balancing operations.



THOROUGH TESTS AND INSPECTIONS—before, during and after repairs—verify condition of your returned equipment, mechanically and electrically. That's why all Westinghouse Repair Plants guarantee their work.

RAPID SERVICE IS ALWAYS NEARBY—42 Westinghouse Repair Plants are located coast to coast, ready to get your equipment back on the line with the *right* repairs made in a minimum length of time.

Sparkler Opens New Conroe, Texas Plant

Sparkler Manufacturing Co., producers of industrial, commercial and municipal filtration equipment, formally opened their newly constructed sales headquarters and plant in Conroe, Texas, on August 12.

Sparkler moved its operation from two plants in Mundelein and North Chicago, Illinois last spring.

Despite the unavoidable lag in setting up production in their new plant, manufacturing capacity now already exceeds that of the combined output of the two Illinois plants, and this level is expected to climb within the next few months.

FUTURE EVENTS of Engineering Interest

Oct. 10-12: National Electronics Conference & Exhibition, Hotel Sherman, Chicago, Ill. Rudolph J. Napolitan, Gen. Mgr., NEC, 228 N. La Salle St., Chicago 1, Ill.

Oct. 17-21: 42nd National Metal Congress & Exposition, Philadelphia Trade & Convention Center, Philadelphia, Pa. American Society for Metals, Metals Park, Novelty, Ohio.

Oct. 19-21: 37th Annual Convention, The National Management Assn., Dinkler-Plaza Hotel, Atlanta, Ga. Sec'y NMA, 333 W. First St., Dayton 2, Ohio.

Oct. 24-25: ASME-AIME Fuels Conference, Daniel Boone Hotel, Charleston, W. Va. American Society of Mechanical Engineers, 29 W. 39th St., New York 18, N. Y.

Oct. 28: Southern Regional Meeting, Natural Gasoline Assn. of America, The Carlton Hotel, Tyler, Texas. Wm. F. Lowe, Exec. Dir., 421 Kennedy Bldg., Tulsa 3, Okla.

Nov. 1-3: Material Handling Institute, Central States Show & Technical Conferences, Kentucky Fair & Exposition Center, Louisville, Ky. Paul A. Fisher, Ch. Engr., Anaconda Aluminum Co., Louisville, Gen. Chm.

Nov. 3-4: 9th Annual Instrumentation Conference, School of Engineering, Louisiana Polytechnic Institute, James W. Malone, Pub. Chm., Ruston, La.

Nov. 9-11: 2nd Power Industry Computer Application Conference, Chase Hotel, St. Louis, Mo. Power Division and Computing Devices Committee, American Institute of Electrical Engineers. Sec'y AIEE, 33 W. 39th St., New York 18, N. Y.

Nov. 18: Panhandle-Plains Regional Meeting, Natural Gasoline Assn. of America, The Herring Hotel Amarillo, Texas. Wm. F. Lowe, Exec. Dir., 421 Kennedy Bldg., Tulsa 3, Okla.

Nov. 28-Dec. 2: 24th National Exposition of Power & Mechanical Engineering, New York Coliseum. International Exposition Co., E. K. Stevens, Mgr., 480 Lexington Ave., New York 17, N. Y.

Nov. 28-Dec. 2: ASME Winter Annual Meeting, Statler Hilton Hotel, New York. Sec'y, American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y.

Jan. 20, 1961: Gulf Coast Regional Meeting, Natural Gasoline Assn. of America, The Robert Driscoll Hotel, Corpus Christi, Texas. Wm. F. Lowe, Exec. Dir., 421 Kennedy Bldg., Tulsa 3, Okla.

Feb. 13-16, 1961: 15th International Heating & Air Conditioning Exposition, International Amphitheatre, Chicago, Ill. American Society of Heating, Refrigerating & Air Conditioning Engineers, National Meeting. International Exposition Co., 480 Lexington Ave., New York 17. E. K. Stevens, Mgr.

Feb. 24, 1961: South Louisiana Regional Meeting, Natural Gasoline Assn. of America, Lafayette Petroleum Club, Lafayette, La. Wm. F. Lowe, Exec. Dir., 421 Kennedy Bldg., Tulsa 3, Okla.

March 15-17, 1961: 40th Annual Convention, Natural Gasoline Assn. of America, The Baker Hotel, Dallas, Texas. Wm. F. Lowe, Exec. Dir., 421 Kennedy Bldg., Tulsa 3, Okla.

April 12-13, 1961: AIEE Materials Handling Conference, Hotel Sheraton, Philadelphia, Pa. H. A. Zollinger, Chm. AIEE Materials Handling Subcommittee, Westinghouse Electric Corp., Pittsburgh, Pa.

April 28, 1961: Oklahoma Regional Meeting, Natural Gasoline Assn. of America, Lake Murray Lodge, Ardmore, Okla. Wm. F. Lowe, Exec. Dir., 421 Kennedy Bldg., Tulsa 3, Okla.

May 19, 1961: Permian Basin Regional Meeting, Natural Gasoline Assn. of America, The Lincoln Hotel, Odessa, Texas. Wm. F. Lowe, Exec. Dir., 421 Kennedy Bldg., Tulsa 3, Okla.

Instrumentation Conference — La.

The School of Engineering, **Louisiana Polytechnic Institute,** Ruston, Louisiana, will hold its Ninth Annual Instrumentation Conference on the campus November 3-4.

In addition to papers presented at the technical sessions, exhibits of new equipment in instrumentation and process control will be displayed.

TIMELY COMMENTS

IMPROVEMENTS — Be Sure You Get What You Want

WHAT DO YOU WANT? What do you need? What would be the perfect solution to your industrial, engineering or production problem?

Perfection is usually expensive, but sometimes it is cheap. The best solution may actually be the cheapest in some instances. In other cases it may cost way more than it is worth to get that last little increment of improvement.

But this discussion is not primarily concerned with engineering cost analysis. We are discussing here the need for good basic thinking habits in pushing forward toward the ever important goal of *Better Production*.

Since Better Production is the theme of this annual special issue, and we are hopeful the reader's thoughts will be turned in that direction — it is appropriate to repeat, "What do you want? What do you need?"

Perhaps too frequently we are tempted to try to "keep up with the Joneses," when actually we would do a lot better to lead off ourselves and let the Joneses try to catch up. Sometimes we see something good and copy it without really stopping to determine if it is the best thing for us. And even as we copy — we may also improve.

It is hoped that the readers will look critically at each of the solutions presented in the many case studies in this issue. Study carefully what the other engineers are doing, but never assume they have done the best. And never assume that their conditions are exactly like your own. Look for ideas rather than details.

Then make your own analysis of your own problems and develop your own solutions to meet your own needs.

Perhaps as good a line of action as any is to proceed in the following A, B, C order.

A—What do you want? Write down the results that would most perfectly serve your need.

B—Write down all known procedures that would provide exactly or approximately the results you are seeking.

C—Talk with equipment salesmen and get their suggestions and descriptive literature on the equipment they recommend.

D—Check with other engineers in your field. Benefit from their failures as well as their successes. Make a few visits to other plants if the job is big enough to justify the expense.

E—Determine the current attitude of your executives toward spending money. Do you want the very best or just the best your budget will permit?

F—Be sure you know pretty well the money value of the improvements you want to make. You may have to do quite a little "digging" in your own organization to get this answer.

G—With answers to all of the above questions fairly well in hand, it is time to start preliminary engineering and cost studies.

Many of the ideas originally put in the pot for consideration will fall by the wayside quickly — as too expensive, too frail, too elaborate, too slow, or not quite good enough.

But almost invariably you will be left with several reasonable choices. Now is the time for detailed engineering studies. Some of the choices may be almost a draw.

Then when the choice is almost apparent, take another look. Is there a parallel problem that should be solved simultaneously? Is your solution going to adversely affect some other phase of operation? All of these things seem obvious but many slips are made by even the best engineers — such as building the bath house on the low side of the lot and later finding that waste water would have to be pumped to the sewer.

You won't find many "packaged" answers in the numerous case histories presented in this issue. But you will find food for thought — ideas and solutions that will help you develop your own plans to get what you really want in way of improvements.

Case 1 — Electro-Mechanical Research, Inc. . . . . Sarasota, Florida

Pure Water — Key Element in Precision Work

By HARRY J. MILLER
Sarasota, Florida

Superintendent of Production Lloyd Manus (left). The plating was defective on these purchased components and the parts are being readied for replating in EMR's new shop.

RECENTLY MOVED to the South from New England, EMR is involved in the field of instrumentation for research and telemetry. Its prime customers are the Glenn Martin plant at Orlando, and the missiles mecca of Cape Canaveral. It manufactures complex components for airborne data collection and transmission for missiles and aircraft.

The local plant covers 90 acres and 100,000 square feet. Total employment is more than 450, and of this number approximately 150 are engineers and technicians, at a ratio of one to two. The company's New Jersey plant employs 350.

Typical local products are all manner of subcarrier oscillators, VHF radio transmitters flown in guided missiles and experimental aircraft and automatic calibration equipment. In addition to standard catalog products, EMR utilizes its own units, in conjunction with those of other manufacturers, to design, construct and install such facilities. An outstanding example of EMR's productive genius is the airborne telemeter for the Martin Company's Titan program and Martin's ground stations which were designed by EMR.

And there's the rub.

When it comes to making the metal chassis and enclosures for these components, measurements must be held to tolerances like 4.437 inches in height, 1.850 inches in width; 1.250 inches in depth.

In short, tolerances are held to such dimensions for the metal work as plus or minus .005" between the centerlines of holes punched in the chassis. In New England such work was farmed out, and was performed to the

All plumbing and electrical facilities beneath the floor, makes an uncluttered plating room; intake and exhaust system rids area of fumes.

company's satisfaction. However, when EMR moved here, it ran into several snags. To obtain the caliber of production it was accustomed to, the metal chassis had to be made in Miami, since local suppliers, instead of working to plus or minus .005, were more apt to make the numerous holes at a deviation of 1/16th to 1/32nd of an inch — a major calamity in view of the fact that these components must nestle in certain crowded spaces in missiles.

EMR's Lloyd Manus, Chief of Production, says that while the Miami supplier was satisfactory, this, too, was a handicap in that there was the additional cost of freight and the difficulty of communication.

To send its components back to New England fabricators posed the same problem.

New Sheet Metal Plant

As a consequence, a complete sheet metal plant was installed by EMR.

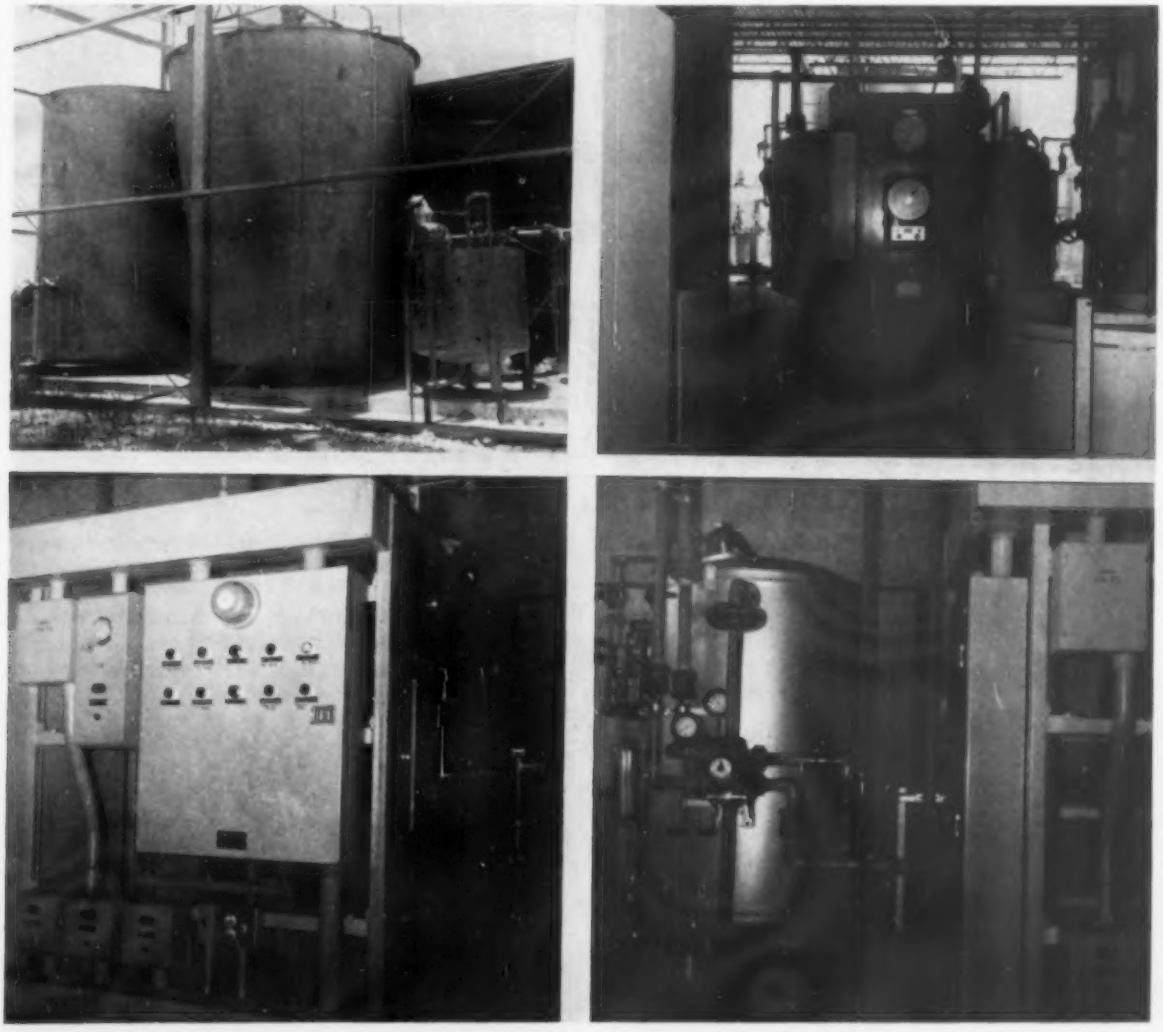
The company had the same problem with plating in which it works copper, cadmium, gold and silver. Local platers returned components bearing blisters and imperfect as to quality and quantity, both vital to these delicate sheet metal fabrications.

As Mr. Manus puts it: "We could get quality in Miami and Jacksonville, but not on any short notice basis, and time is often of the essence with us. After receiving the components, our rigid inspection might turn up flaws resulting in their rejection, and this involved us in endless paper work and communications.

"Same thing with area plating vendors. We couldn't obtain the quality needed for our particular operation. We sought control over quality and time."

As the set-up is now, EMR spent close to a quarter million dollars for equipment. In so doing, the plant will woo fabrication from other firms whose quality standards are as critical as EMR's. In the main, this sheet metal department makes a steel chassis that is black anodyzed, and the plating area, also, has been constructed in anticipation of far more potential

The water treatment plant (Permutit) is a vital adjunct to improved production in EMR's new metalworking and plating plant. Waste must also be treated before going to the sewer.



than is currently the output.

Says Mr. Manus: "We now have complete control over time, quality and personnel; our facilities are most modern; our scheduling more exact."

Included in this upping of production is a complete painting shop with modern ovens that turn out quality-baked painted components.

Previous plating quality from the vendors often showed up as pits and bare spots, especially with finishes like bright nickel and proprietary processes like black Ebonel Irriditing.

In the painting area, where 49 different colors are used, it was quite common for area vendors to return components of stainless and mild steel and aluminum, on which the paint peeled, in short order. In any other field but missiles, this could perhaps be tolerated, but this is verboten in the telemetry instruments designed for space junkets.

—— Water Problem Solved ——

One of the chief problems in the plating area was the water supply and the treatment of waste water for removal of toxic cyanide and chromates, prior to their discharge into sewer lines. Again, the well-water had to be freed of minerals like sulphur and magnesium which hampered the plating process.

This problem was resolved by the installation of the Permutit plant shown in the photographs, which provides treatment for the potable water supply, cooling tower make-up, plating room make-up and waste and sanitary waste.

One economy feature of this installation is that plating room make-up water and non-cyanide-containing rinse waters are filtered and de-mineralized, yielding water for metal finishing rinsing, while the chemicals in the plating room rinses are concentrated in the regenerant wastes.

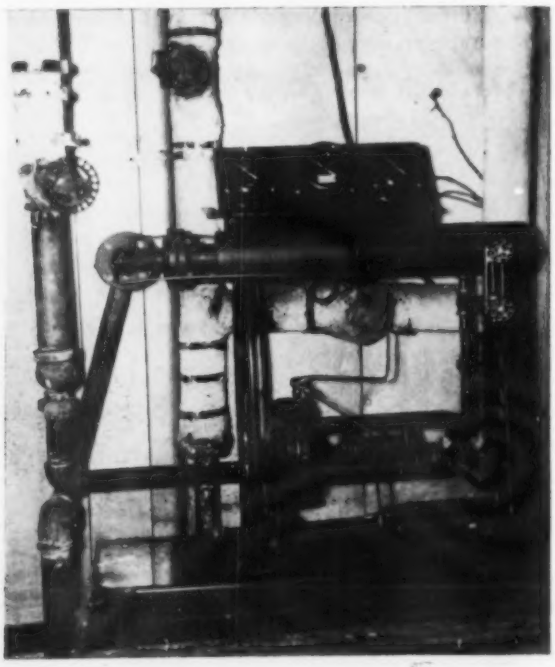
In addition, cyanide waste waters are converted into non-poisonous substances by alkaline chlorination in a cyanide destruction basin.

The components made by EMR are of extremely close dimensions to fit many mating parts, and the company can ill afford a mass of rejections by governmental agencies and contractors. As Mr. Manus says: "Our runs of sheet metal units are small but of machined tolerances. If we were out for great production runs, we'd build stamping dies, but this is not economically feasible in our work.

"We're using conventional sheet metal procedures to produce precision work," says Mr. Manus, asserting his department envisions fabrication of terminal boards and increased production of printed circuitry.

Case 2 — South Carolina Bleachery

Condensate Control Improves Dryer Performance



AN ARBOGAST condensate control used on a National Loop Dryer at Jefferson Bleachery, Jefferson, S. C., has helped to achieve the desired temperatures in this steam heated dryer, according to officials at the plant.

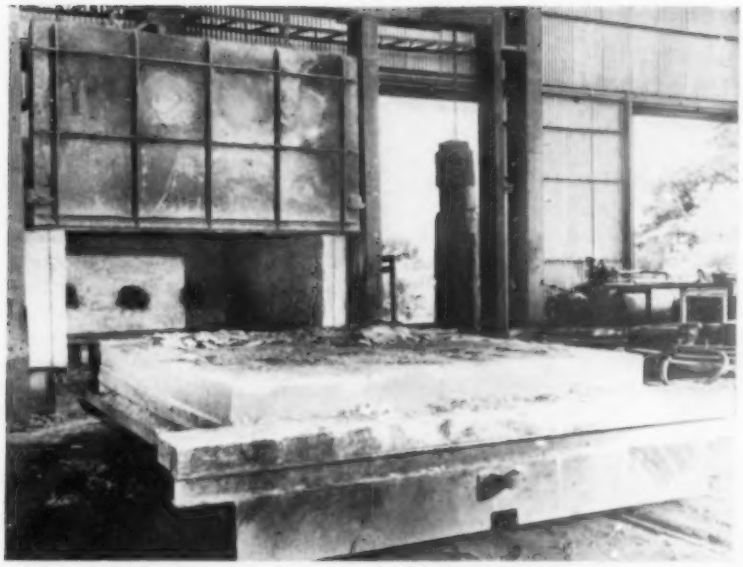
Formerly, bucket type steam traps were used, and on certain fabrics in four strands passing through the dryer, 340 F was necessary to dry the goods. But this temperature was not obtained uniformly because the steam was not dry. The 16 bucket type traps permitted too much hot water condensate in the heaters which kept the temperature down. The oven is also used for drying and curing resin finishes.

Combined with a new boiler, the Arbogast control assures drier steam and constant temperatures in the dryer.

With the new control, there is less plumbing, and one control replaces all 16 traps. Maintenance on the plumbing is entirely eliminated, and there are no "steam hammers" upon starting up after weekends. On one occasion before the change, a heater was ruined by a steam hammer, and the cost of replacement was $700.00.

Oil consumption dropped 300 gallons per week upon installing the Arbogast unit. It should be amortized in approximately six months on the basis of actual savings. This does not include reduced maintenance costs, improved quality, and other benefits.

The Arbogast condensate control is manufactured by Southern Machinery Co. of Charleston, West Virginia. The unit at Jefferson mills was furnished by Kincaid Engineering of Gastonia, N. C.



Temperatures inside furnace range from 2200 to 2800 F, which means that intense thermal shock is imposed on refractory linings when car bottom is pulled out at these temperatures. Yet in two and one-half years of operation, maintenance costs have been very low, and down time held to a minimum.

Case 3 —Gulf Forge Company

Engineered Lining Reduces Maintenance On Car-Bottom Forging Furnace

GULF FORGE COMPANY, Houston, Texas, decided to break into the large forgings business. First they purchased an 804,000 pound Mesta steam-hydraulic forge from the Naval Gun Factory. But then the firm's batch furnaces could not economically maintain a constant supply of heated billets to "Big Pearl," as the forge is called. Getting the billets into and out of the side door furnaces was difficult.

The job required using a fork lift truck, fitted with a rotating head and a set of grappling irons. This method was both cumbersome and time-consuming. Consequently a car bottom furnace was called for to feed Big Pearl.

To engineer and install the furnace, Gulf called on Plibrico Sales and Service Division of M. O. Fulton Company, Houston, who provided complete design and engineering, as well as installation of the furnace and lining.

Billet handling is now greatly simplified. An overhead crane lowers a billet onto the car, and the car is pushed into the furnace. A guillotine door, which when closed actually forms one side of the furnace, is then closed and the furnace is fired up. Burners fed with high pressure natural gas provide the heat, which is automatically controlled.

Removal of the heated billet is equally simple. The door is raised, the car pulled out of the furnace on steel rails embedded in the floor, and the crane lifts the heated billet off and swings it over to the forge.

"The lining is probably the most important engineering consideration in a furnace of this type," explained Edward C. Crawford, vice-president of Gulf, "because it suffers extreme thermal shock when the car is pulled out of the furnace which is at full operating temperature. Linings especially designed to withstand these shocks, as well as the continuous application of high temperatures, are a must."

Gulf's furnace sides and roof are lined with Plibrico Super "F," a plastic monolithic refractory made by Plibrico Company of Chicago. The car top is lined with Plibrico castable refractory.

"Since the lining resists softening, even at temperatures close to its fusion point, it can withstand vitrification, even under tough service conditions," Mr. Crawford said. "It's also virtually shrinkage-free at all temperatures up to the fusion point, making it tight and stable, and reducing heat loss to a minimum."

The linings were also chosen for their resistance to mechanical shock. "Choosing the right lining has paid off," said Mr. Crawford. "Maintenance costs are held to a minimum. This makes for less down time, more production. In the two and one-half years that the furnace has been in operation, the interior has not needed repairs at all, and only minor repairs have been made to the car bottom lining. Because we can now make larger forgings at a profit, we have broken into a market that was closed to us before."

Write the Editors

More Information Available

MANY of these plant-tested techniques can be put to work towards increasing production in your own plant. Case studies in this 13th Annual BETTER PRODUCTION Issue are necessarily brief. Emphasis is concentrated on direct information — need and objectives, description of improvements, and results.

TO HELP you put these ideas and methods to work, equipment manufacturers have been identified in most cases. If additional information is desired, contact your local mill supply house, manufacturers representative, the equipment manufacturer, or drop a note to SPI, 806 Peachtree St., N.E., Atlanta 8, Georgia. There is no obligation.

Case 4 — Georgia Electrical Equipment Manufacturer

Finishing Conveyor Saves Man-Hours and Increases Production

PRODUCTION was doubled and one shift of painters was suspended on the installation of a Richards-Wilcox Zig-Zag continuous overhead powered conveyor in the finishing department of Walker Electric Company of Atlanta, Georgia.

Previous to the installation of this finishing conveyor, the product was placed upon carts at the assembly area and pushed to the cleaning area to be degreased, launderized, washed and then pushed to the paint booths. During the operation of cleaning, it was necessary to unstack, do the operation and restack the products on the rack.

View of Finishing Conveyor: 1—Conveyor coming out of degreaser; 2—material moving from paint area into drying oven (3); 4—line is long enough to provide cooling so men can handle material.

Paint area, showing how each of the four painters takes every fourth item as described in the article. Note neatness of area.

The operation in the paint area was as follows: the painter's helper handed the product to the painter and then replaced it on the rack. After the rack of parts was completely painted, it was pushed into an oven where it remained for seven minutes. The rack was then taken to the packing area where it was unloaded and the rack was then returned to the assembly area.

The new finishing conveyor was designed to take the product from the assembly area through an automatic degreaser, paint booth, drying oven and then to the unload area without being removed from the time it was placed on the conveyor at the point of loading in the assembly area to the point of packing.

One innovation, which was developed here, is the paint spray area. There are four painters in line and as the conveyor carries the product past the painters, each painter paints every fourth part. With the process as described for painting, the paint area is very neat and uncluttered and it would be a simple matter to increase the speed of the conveyor and add an additional painter or painters as required for necessary increased production.

Another savings and advantage this finishing conveyor has given to Walker Electric, is the fact the conveyor carries the finished product to different points for unloading. Previously, it was necessary to unload the carts after they came out of the drying oven and then send a portion of the parts from the first floor to the second floor by the elevator, where they were picked up by an employee and distributed to the places they were required. With the present conveyor, the materials required on the lower floor are unloaded there and the remaining ones go to the second floor and are removed at the point where they are needed.

When the finishing conveyor was

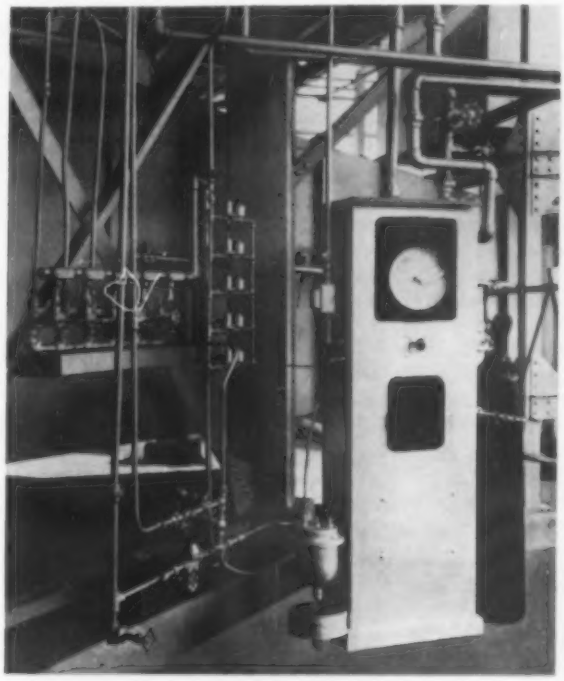
being considered, the goal of Walker Electric Company was to increase production by 20% with the hope the second shift of painters could be eliminated. This was the basis on which Art Hobbs, salesman for Richards-Wilcox in the Atlanta office, proceeded.

After the installation was made and workers became familiar with the use of the conveyor, Carl Owens, Jr., plant manager of Walker Electric Company, stated they were able to double production, cut off the night shift of painters and their helpers, and save the labor of the painters' helpers on the day shift. Taking into consideration the increased production, the savings in labor and the quality control of the finish of the product made possible by the installation of this conveyor, he estimates that the equipment paid for itself in less than ten months after installation.

Mr. Owens is at the present time working on plans for an automatic painting process to be used in conjunction with this powered conveyor. He hopes to eliminate all hand painting and make the finishing process completely automatic.

Case 5 — Texas Refinery

Multi-Point Sampling System Reduces Cost of Gas Analysis



A Bailey Meter continuous recorder, oxygen analyzer and five-point sampling system are installed at a Texas refinery to reduce cost of gas analysis per point. The panel contains a two-pen receiver-recorder and an oxygen analyzer. Immediately to the left of the panel is the pneumatic system which includes pressure reducing valves and solenoids. The sample transfer valves are located to the left of the pneumatic system.

SAMPLING of gases at many points is economically justified at a crude oil processing plant in Texas by installing a five-point sampling system and an oxygen analyzer to reduce the cost per point. Samples of refinery gases are obtained with a Bailey Meter multi-point sampling system and conducted to a Bailey oxygen analyzer and receiver-recorder to measure the percentage of oxygen in the gaseous mixture.

Installation of the continuous recorder, oxygen analyzer and multi-point, water aspirated sampling system has resulted in considerable savings in the process of obtaining properly heated oil for distillation and cracking.

Waste refinery gases are used for fuel by the Texas company to heat gas fired oil heaters wherever possible, while more expensive natural gas is used to supply requirements which cannot be met with available waste gas supplies. Since the Btu of refinery gas varies, some excess air measurement and monitoring is necessary for efficient operation.

The oil heaters consist of furnaces that are lined with tubes through which oil is passed for the purpose of bringing it to the proper temperature prior to distillation and cracking. The rate of oil flow through the heater is usually maintained constant and the firing is controlled to maintain a constant oil temperature.

The five-point gas sampling system provides a continuous, clean gas sample to the gas analyzer. A timer inside the oxygen analyzer panel automatically actuates electrical controls to obtain samples from each point every hour. An override switch on the panel permits manual selection of any point desired.

The gas analysis is transmitted to a two-pen receiver-recorder which records both the per cent oxygen and the point sampled. The recorder senses changes of less than 0.05 per cent oxygen content in the gas sample.

Thirteen additional analyzer installations are located throughout the Texas refinery.

Case 6 — East Tennessee Packing Company

Modern Coal Burning Equipment Small Investment Makes Big Saving

By W. E. STORY, Plant Engineer,
East Tennessee Packing Co.,
Knoxville, Tenn.

WE HAVE a Babcock & Wilcox four drum Stirling Boiler which was installed in 1929 and was originally fired with a single retort steam operated ram type underfeed stoker with side dump grates. Maintenance and operating costs had reached the point that we considered the installation of gas and oil burning equipment, as well as the possibility of a package gas fired boiler in an effort to reduce our costs.

A number of equipment suppliers submitted recommendations on ways to improve our existing equipment and conserve fuel, as well as conversion to gas and oil. One of the firms we contacted was the McBurney Stoker & Equipment Co. of Atlanta, Ga. After inspecting our boiler room they suggested that they run a boiler test for us and determine just exactly what efficiency we were obtaining with our existing equipment.

The test was run in December 1959, and confirmed our suspicions that we were operating at a very low efficiency, namely 57.2%. Maximum load for one hour was 24,328 pounds from and at 212 F.

Repair parts for our old stoker amounted to approximately $3,000 a year, including maintenance labor. We were paying our firemen approximately $15,000 a year, while burning roughly 6,500 tons of coal per year.

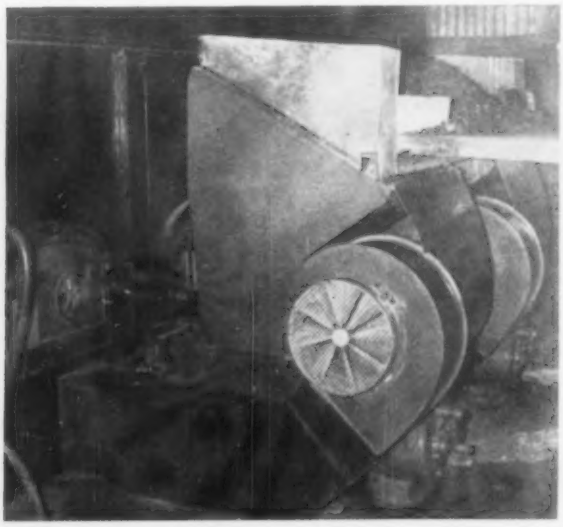
The McBurney people recommended removing the existing stoker and replacing it with two of their own design single retort underfeed stokers. They proposed to eliminate all side dump grates, thereby increasing the amount of live grate area in the furnace, which according to them would increase combustion efficiency and allow us to reduce coal consumption while carrying the same steam load.

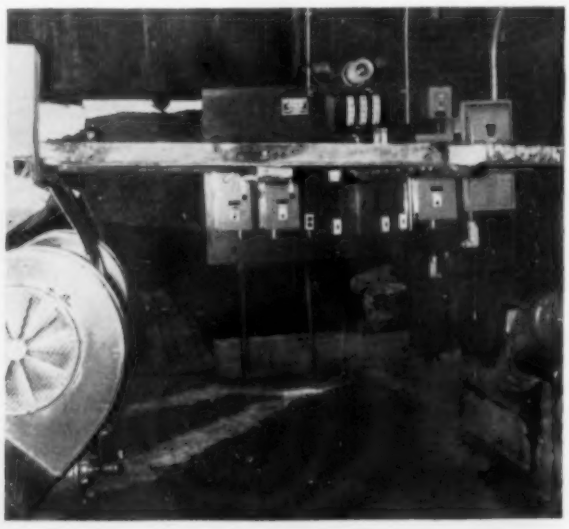
They also recommended that we eliminate our turbine driven forced draft fan and steam driven reciprocating boiler feed pump, both of which were in poor repair. It was also recommended that this equipment be replaced with a motor driven centrifugal pump, and motor driven forced draft fans.

After careful investigation we found coal would still be our cheapest fuel. McBurney installed the two coal stokers in short order, along with such automatic equipment as a new furnace draft regulator, automatically controlled boiler feed pump and feedwater regulator. Our furnace refractory was also put in first class condition.

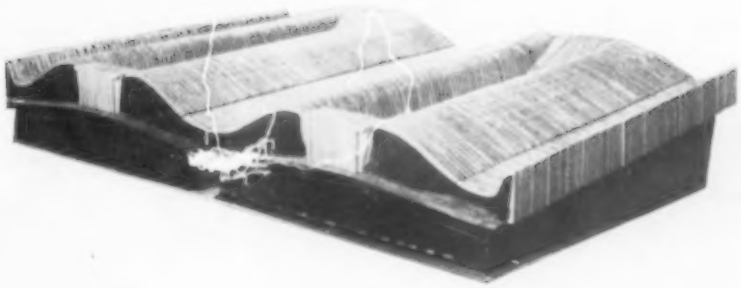
We decided not to install an automatic coal conveyor at this time, since our coal storage is just outside the boiler room and we

Two views of the stoker — with controls shown at far right





This is the double stoker tuyere arrangement as installed at East Tennessee Packing Co. Tuyeres are nickel-chrome alloy iron. Sloping the tuyeres from the retorts to each side and front to rear gives good fuel distribution without moving grates.



felt that our operators could continue filling the new hoppers by wheelbarrow, just as they have been doing for years with the old type stoker. There is actually less manual labor required with the new stokers which pleases our operators.

A particular feature we like is the ability of one stoker to carry up to two-thirds full load in event of a sheared pin or trouble with the other stoker. This is possible since each stoker is complete with integral forced draft fan and separate windbox supporting the tuyeres or grates. The tuyere extensions have turned up ends at the furnace side walls to prevent hot ash from sticking to the refractory.

Our boiler was out of service approximately two weeks and was returned to service on the first of May.

Since that time we have not had an opportunity to run another boiler test. However, our production is up between 50 and 60% over last summer, and our records show that we have burned less coal than we did during the same period last year. We are able to maintain a steady steam pressure without any difficulty whatsoever.

Our operators are well pleased with the simplicity of the stokers. They particularly like the ash removal at the rear of the boiler, and the elimination of the old side dumping grates. We are able to keep our boiler room much cleaner, and are pleased with the performance of this equipment.

Our total investment, including labor for piping and wiring modifications, was less than $14,500 which represents a cost of 58c per pound of installed steam capacity.

Case 7 — Levingston Shipbuilding Company - Texas

Flame Spraying Protects Against Corrosion

THE LEVINGSTON Shipbuilding Company of Orange, Texas, has long been a user of metallizing equipment in both repair and new construction. The restoration of worn machine elements is common but the biggest application is the spraying of pure aluminum or zinc as a means of protecting against heat or atmospheric corrosion.

So popular have these coatings become for shielding large units that this progressive company has now branched out and does contract work for industries, such as oil refineries, that are not in its normal marine field.

The large gas engine muffler in the picture is used in heavy-duty pump and compressor service in a refinery. It was first sandblasted and is shown being given a heavy coating of pure aluminum. No finishing is necessary. The corrosion problem here was caused by a combination of exhaust temperatures high enough to buckle the baffles, plus a heavy, sea-salt atmosphere, particularly corrosive when the muffler is heating or cooling past the condensation point.

More in line with Levingston's regular work, a steel tugboat hull 105 feet long was given a heavy coating of pure zinc down to one foot below the waterline. The protection against salt water corrosion was so successful that, two years later, the same owner ordered a sister ship metallized during construction. The flame spraying equipment used by the Levingston Shipbuilding Company is manufactured by Metco Inc.

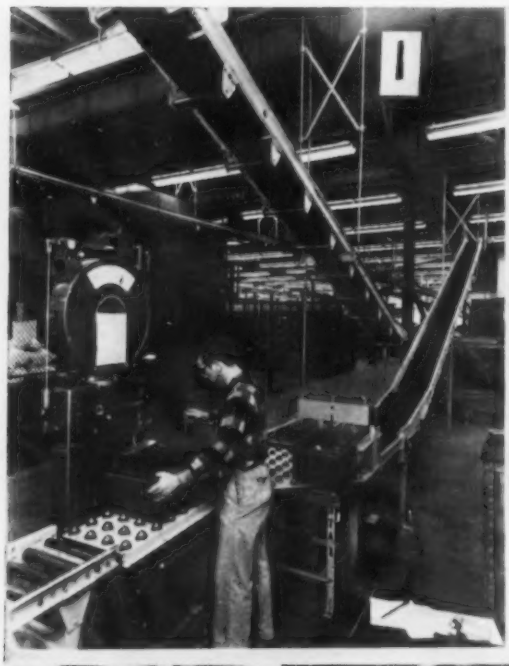


Fig. 1—The selector pin being positioned here is the heart of this conveyor system's prime feature. It is possible to dispatch a tote box from any station within the system to any other station. Any unpinned boxes are automatically shunted off the main loop at Station #1 which is the marshalling center for all boxes.

Fig. 2—Photo shows inspection and receiving station for all parts coming from final tumbling — plating — heat treating — spray operation. After quality control inspection accepts parts, they are moved to finished parts stock room.

Fig. 3—Parts that need washing or tumbling are returned by conveyor (overhead in background) which loops them into the area. This station is one that can go unattended, letting pans of parts accumulate until operators are ready to place them in tumbling or washing equipment. Limit switch in foreground is depressed by the pans and stops feeding of pans from live roller conveyor to gravity unit.

Fig. 4—This photo shows the part of the finishing area where the main conveyor loop and the conveyors within the finishing area converge.

. . . . . Moving Problem Solved

By C. H. FARRINGTON
Production Manager
Royal McBee Corporation

Fig. 5—(The center of transfer) Pans of parts are shown moving from the secondary punch press and general machining and subassembly area. Parts are also being moved from cleaning to the finishing area at this point.

WHEN EXECUTIVES of Royal McBee Corporation, Port Chester, New York, manufacturers of business machines and a complete line of typewriters, made the decision to relocate their portable typewriter manufacturing, they were well aware of the immense pre-planning necessary to assure a smooth transition of production operations from the Hartford, Connecticut plant to the proposed Springfield, Missouri location.

From the time the first architectural sketch was submitted until the 300,000 square-foot, one floor structure was completed, it was natural to expect that there would be some problems associated with the project.

Without too much difficulty, one can readily visualize the many and varied problems that can be normally associated in manufacturing a precision product made up from approximately 2,000 parts, all the while meeting the needs of the more than 7,500 Royal portable dealers throughout the nation.

The group of Royal McBee management men that were assigned the project in its entirety immediately gave special attention to the problem of smooth production buildup once the move was underway.

Among the major considerations this task force was required to make was one relating to material handling in the spacious, modern one-floor structure. Many months before the decision, the production and plant engineering team of Royal McBee presented the details of the material handling problem to the engineers of several companies with competence in this field.

The "mythical ball" was batted back and forth many hours before the final decision was reached. Based on their presentation, the installation of the manufacturing conveyor system was assigned to the Alvey Conveyor Manufacturing Company of St. Louis, Missouri.

The basic system suggested, designed and installed by Alvey engineers as best adaptable to the situation is known as a "pin set" belt and roller system. It also embodies the use of a great amount of gravity conveyor in connection with live-roller units.

The system extends throughout all manufacturing and finishing areas of the new Missouri plant.

By means of the "pin set" system of routing, work can be directed to any of the various departments throughout the plant.

It is what is known as a closed loop system (3 loops within a loop) and therefore is not limited to one way traffic.

Approximately 4,000 feet of various types of conveyor are used to provide 3 basic functions:

A. Conveyorized handling of tote pans of parts from work or storage areas to inspection and scale positions. From inspection and scale positions to the main loop with a minimum of handling.

B. Pin set tote pans of parts may be conveyed from any sending station to any receiving station and from the main loop to receiving conveyors. Pin set pans may be dispatched from any sending conveyor to any other receiving conveyor in the system.

C. The system provides automatic live accumulation of parts from main loop to a given receiving station so that receiving operators do not have to attend receiving conveyors constantly — but only at spaced intervals depending on the amount of flow of parts. Thus the receiving operators will handle the pans of parts in quantity and are therefore free to perform other functions until the accumulation conveyor at his station is again filled.

Other features such as a vertical lift at the end of the packing line that moves the packaged portable typewriters to the finished product storage area and an arrangement of skate wheel conveyor for simplified handling of painted parts in cartons, are parts of the system.

Sketches and photos show the chronological use of the conveyors as precision parts used in making Royal McBee portable typewriters are channelled to assemblers and eventually wind up a packaged product ready for immediate shipment.

Case 9 — Texas Aircraft Plant

Steam Heating Most Advantageous for Forming Fiberglass Reinforced Plastic

By F. C. CLAYTON
Chief Plant Engineer
Convair, Fort Worth, Texas

MOLDED PLASTIC and adhesive bonded structural parts for aircraft require very rigid quality control and close tolerances. Pressure and temperature must be closely controlled to assure maximum strength, and dimensional control must be of the same order as machined metal parts.

An important consideration in designing for production of such parts is the heat source. Sources studied and/or tried out, were electrical, including radiant; induction (high frequency); and conduction from cast-in-place heating elements. Also, circulating liquids, including oil, proprietary chemicals (i.e. Dow-Therm) and high temperature water. Finally selected, however, was steam.

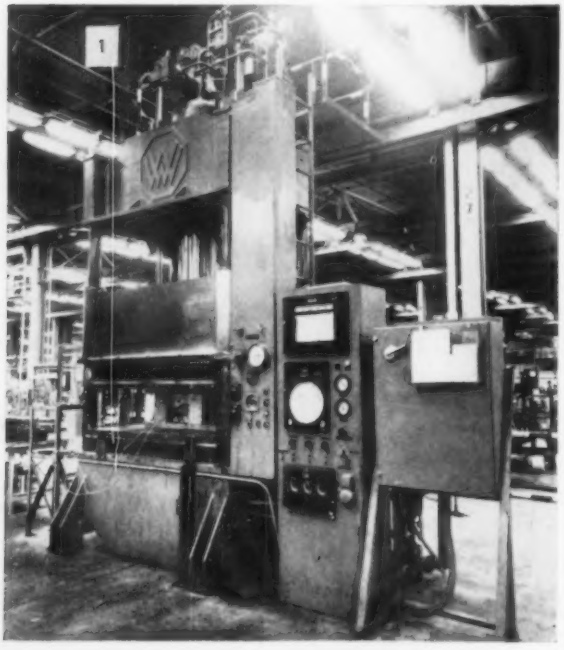
Most curing is done with closely controlled temperatures in the range of 300-375 F. High pressure steam was available. Temperature is easy to control by controlling pressure.

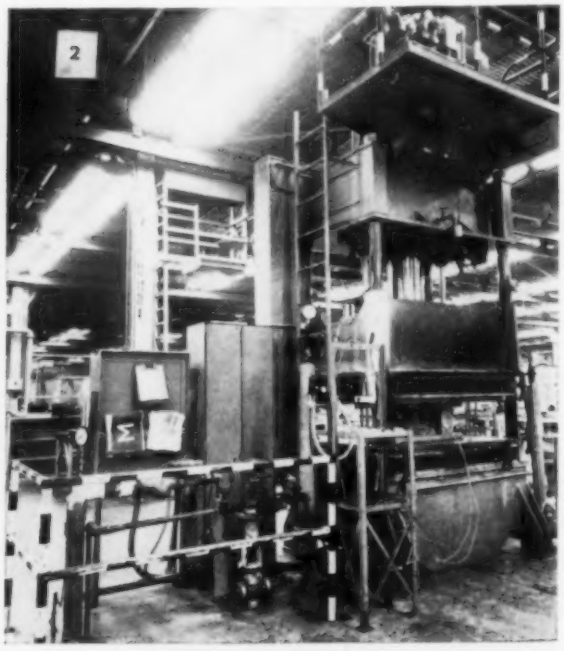
One of the time consuming elements of a plastic or adhesive bonding cycle is cooling to "set" the adhesive. By simple valving, steam is cut off at the end of the curing time and cold water is circulated through the steam passages. This quickly cools and "sets" the plastic materials so they can be removed and handled without loss of time.

Photos 1 & 2 (front and back views, respectively) show one of the hydraulic presses used to form and cure fiberglass reinforced plastic parts. This is done on an automatic preset cycle in which temperature is controlled from thermocouples in the dies by regulating steam pressure and pressure is applied and regulated hydraulically. The steam heated platens are insulated from the press by air space and asbestos board. The dies are made from aluminum alloy for easy machining and finishing, and good thermal conductivity.

One advantage of steam heat is ability to use any size die up to the full area of the platens without incurring heat distribution problems. Using this method with closed dies, tolerances can be held in the order of .003", comparable with machined metal. Chart type control instruments are used, as our quality control procedures require a complete record of manufacturing conditions for each part.

Photo No. 3 shows one of a number of bonding presses used to fabricate honeycomb filled panels,



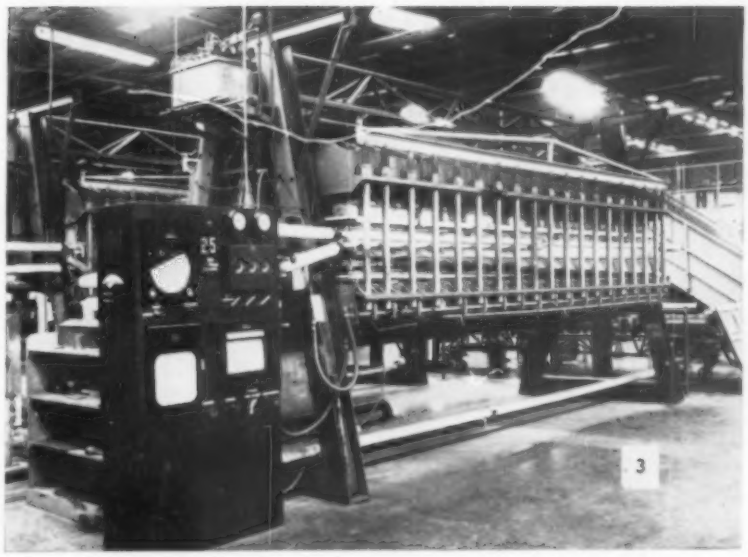


in this case, wing skins. The parts consist of top and bottom aluminum alloy skins separated by an aluminum "slug" or spacer which forms the outer edges and other paths where structural fasteners must be installed. Other space is filled with a honeycomb material, either fiberglass-plastic or aluminum.

Other Applications

This type of press could be used equally well for commercial honeycomb panels of any adhesive bonded or thermosetting materials.

Heating and cooling cycle controls are similar to the plastic press described above. Pressure (approximately 170 psi) is furnished by compressed air applied to a thin stainless steel diaphragm back of one die.

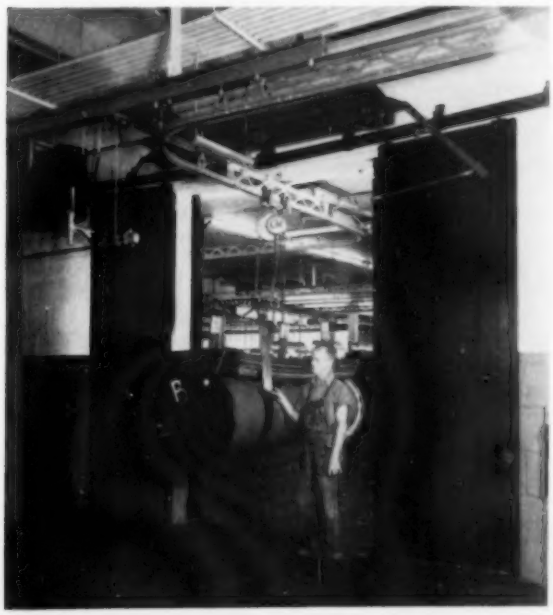


Dies are made with integral steam passages from 2½" and 3" thick slabs of aluminum alloy. After trimming to size, slots are milled in longitudinal edges. Then holes are drilled laterally using a multiple spindle rifle drilling machine. After drilling, the slots are closed by welding on a cover, with pipe fittings at the ends, thus forming an integral coil. Next, the dies are formed to the required curvature on a hydraulic press brake and finished by normal die finishing methods.

The matching dies are adapted to the parallel platens of the presses by welding an aluminum plate frame around the outer edges and filling the void with castable insulating material.

Automatic Doors — *Case 10 — Georgia Textile Mill*

PLANT PERFORMANCE and improved production were of paramount importance when Mr. C. A. Townes, purchasing agent for The Jefferson Mills, Inc., purchased the first Stanley "Magic-Door" equipment for Mill No. 2 at Crawford, Ga., in 1951, to assist in the flow of laps between the picker room and the card room.



The use of this automatic door equipment in speeding traffic flow and aiding material handling proved to be so successful that six more such operators have been installed at the No. 1 Mill in Jefferson, Ga., since that time.

In addition to speeding traffic flow, the automatic door equipment made by The Stanley Works offered the additional advantages of humidity and temperature control, reduced door and equipment damage, the conservation of warm and cool conditioned air, the good will and increased safety of employees, and substantial dollar savings.

A recent study of Magic-Door equipment, integrated with an industrial materials handling system and operating plant doors automatically, showed that a similar user was receiving 67 per cent return on his investment each year.

Jefferson Mills, Inc., was founded around the turn of the century. The company has been run by Mr. Morris M. Bryan, Jr., a progressive young textile executive, since 1948. The two mills employ some 550 people manufacturing products from action bale to the finished materials such as corduroy, twills and canton flannels.

Case 11 —
Texas Butadiene Plant

How Expansion Is Controlled

THE 50,000-TON PER YEAR butadiene production plant of Odessa Butadiene Co. at Odessa, Texas, includes a total of eight Houdry Process catalytic reactors.

The reactors are interconnected by five continuous stainless steel headers, ranging in size from 18-in. to 60-in. diameter and designed to operate at 1200 F under vacuum or pressures as high as 45 psig. In addition to the main headers carrying feed, product, regeneration air and evacuation exhaust, it was necessary to tie in other equipment such as quench towers, compressors and a waste heat boiler in locations remote from the reactor bank with lines as large as 72-in. diameter.

Solution of Problem

Process, piping and structural engineers from Fluor Corp. Ltd., the design engineers, together with expansion joint application engineers from Zallea Brothers, the expansion joint suppliers, worked with models to visualize the problems. Expansion joints were thus located, selected and designed, equipment was located, and anchor, guide and support locations were pinpointed for all major components in little more than one week.

Because of relatively severe operating conditions, Zallea special non-equalizing type expansion joints were chosen for all lines. The use of this type of expansion joint, with no external reinforcement on the corrugations, provides for minimum weight and cost.

The bellows (flexing elements) of all expansion joints were hydraulically formed to provide the smooth continuity of shape and uniform thickness required to eliminate stress concentrations and insure maximum reliability. Titanium stabilized type 321 stainless steel was used for all bellows to reduce the danger of carbide precipitation at the high operating temperatures. Internal stainless steel sleeves were incorporated on all expansion joints subject to high velocity flow to reduce the possibility of turbulence with attendant problems of pressure drop and vibration.

It was necessary to accommodate not only axial growth of the five main headers, each approximately 200-ft long, but also the movement of reactors and their connecting branches. To provide complete operating flexibility, allowance was made for one of any two adjacent reactors to be operating while the other was on standby. Similar arrangements were made for all headers, with two slotted-hinged type expansion joints installed between each pair of reactor branches (Fig. 1).

Acting in pairs, these joints are capable of relieving all thermal movement in the headers and reactors. The slotted hinges enable the expansion joints to carry the weight of piping between them and to resist deformation due to wind loading. All parts of these expansion joints, including the hinges, are constructed of stainless steel.

On the various branch lines, systems of three hinged joints were selected to provide maximum flexibility of the complex piping with maximum stability. In most cases, only one external support-guide was required on each such branch (Fig. 2). Rising from ground level to tower connections more than 100-ft above grade, these three hinged systems permitted piping offsets to provide truck and workway clearance.

While most of the expansion joints on the project are of the hinged or slotted-hinged type, different techniques were needed to solve special problems. Regeneration air is furnished by two large compressors, each with a gas turbine drive. It was essential that these machines be protected from the massive thermal reactions generated in the piping but, due to the extremely critical flow conditions at the discharge, the piping configuration was narrowly limited.

The problem was solved by using two 48-in. diameter double-bellows type expansion joints (Fig. 4) capable of absorbing a large amount of axial compression in a limited length. The segment of piping shown in the photograph was isolated by anchors from the balance of the system to prevent the action of pressure thrust on the equipment.

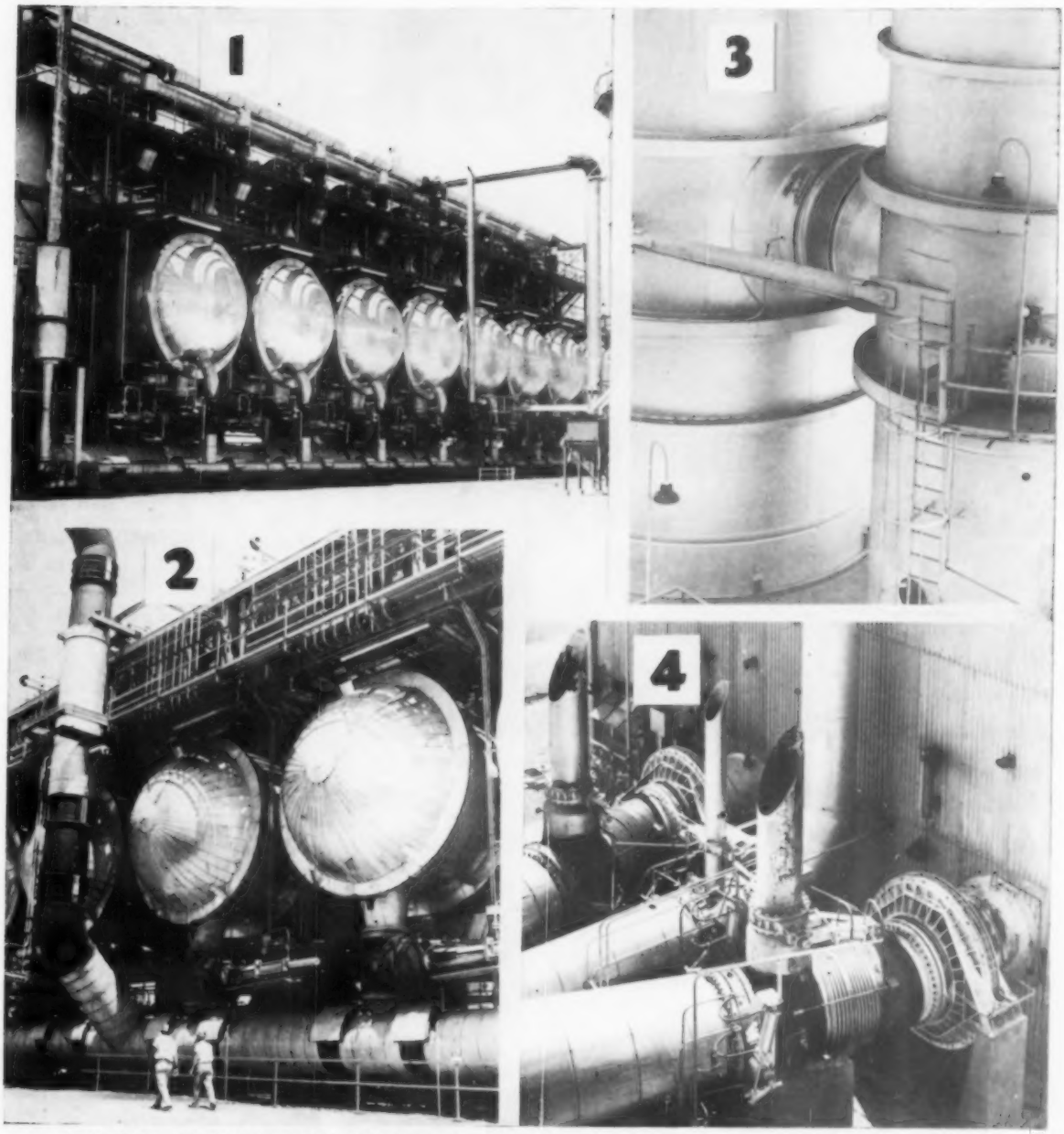
A second special problem was presented by the need to interconnect the pre-quench and quench towers with an opening more than 7-ft in diameter. Locations of these towers were fixed by foundation requirements, and the distance between them was relatively small. Since the opening is located at some distance above the tower support level, and since the towers operate at different temperatures, the expansion joint is required to absorb both axial movement and the differential vertical growth of the two towers.

An 85½-in. diameter non-equalizing type expansion joint was designed to accommodate all of the necessary movement within the limited length available (Fig. 3). In order to withstand the pressure reaction, the tower openings were reinforced with special saddles, and pin-ended tie bars installed at the expansion joint elevation.

Results

The use of approximately 125 specially engineered and designed expansion joints permits containment of this efficient, high production unit in an area whose largest dimension is only a few hundred feet. Even if an infinite amount of low cost land were available, the additional costs involved in the use of piping flexibility alone, including additional pipe and structures, additional power to overcome pressure drop, and increased operating costs would quickly prove prohibitive.

Thus, the very existence of this plant, to say nothing of its two year record of successful operation, clearly illustrates the effectiveness of bellows type expansion joints in controlling thermal expansion under critical conditions.



PHOTOS SHOWING HOW EXPANSION IS CONTROLLED AT TEXAS BUTADIENE PLANT

Fig. 1—End view of reactor bank. Note slotted hinged expansion joint at left without weather hood, and uniform, compact arrangement of similar expansion joints in all headers.

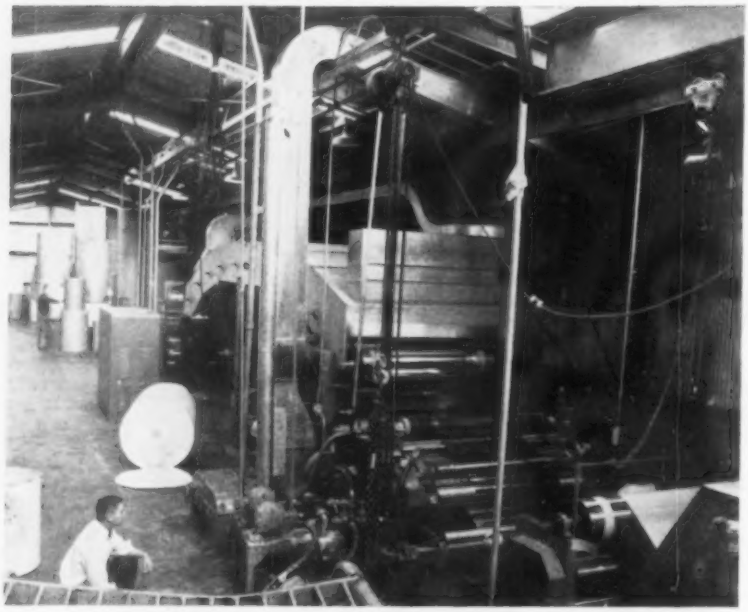
Fig. 2—Front view of 54-in. diameter product header shows slotted hinged expansion joints and hinged loop to pre-quench tower. Note single spring support and guide, rugged hinged and attachment structures for loads greater than 50 tons.

Fig. 3—Pinned structural ties on 85¼-in. diameter expansion joint connecting quench and pre-quench towers permits expansion joint to absorb axial movement and differential vertical movement without excessive load on towers.

Fig. 4—Special features of 48-in. diameter expansion joints at compressor discharge include double bellows for large axial movement, and internal guide sleeve for stability and minimum pressure drop.

Case 12 — Virginia Paper Converting Company

Simplified Lubrication System Proves Versatile and Economical



This is the new Inta-Roto G-1000 continuous laminator recently installed at Hamilton Manufacturing Company, Richmond, Virginia. It is one of only three now in use in the country. When Hamilton installed the unit, Gulf engineers prepared a lubrication chart for the laminator and integrated it with the preventive maintenance program previously developed for other equipment in the plant.

HAMILTON Manufacturing Company, located in Richmond, Virginia, is a paper converting company. Most of its equipment is designed to dry-wax, laminate papers, boards, films and aluminum foil. In the 13 years the company has been in business, there has never been a moment of downtime attributable to faulty lubrication.

It is possible, however, to have good lubrication and still improve upon it, according to R. H. Hamilton, President. He found this out in 1955 when a lubrication engineer representing a major company offered to make a lubrication study of his plant.

When the survey was completed, it was found that all equipment could be lubricated with only six petroleum products. This substantially reduced purchasing and inventorying of oils and greases, according to W. K. Stephens, Plant Manager. It has also reduced the problems of getting the right grease or oil applied to the proper machines. The lubrication plan was prepared by a Gulf Oil Corporation engineer.

Increasing activity in laminating aluminum foil to paper, which now accounts for 60 per cent of the dollar volume of Hamilton Manufacturing, recently led to purchase of an Inta-Roto G-1000 continuous operation laminator. The machine laminates, coats, and prints various combinations.

This machine has a 64-in. roll face and will process a 62-in. web at a rated speed of 1000 fpm. It is one of the only three such machines in the paper converting industry, representing a substantial plant investment for Hamilton.

"When we installed this machine," says Dick Hamilton, "we naturally turned to Gulf to integrate this piece of equipment into our lubrication and preventive maintenance program."

Gulf engineers carefully checked the design and operating characteristics of the new Inta-Roto laminator and recommended use of Gulfcrown grease, a lithium base lubricant already in use throughout the plant; Gulf multi-purpose gear lubricant, also in use throughout the plant on enclosed gear drives; and Gulf Harmony, an oxidation, foam, and rust inhibited oil, for hydraulic power.

Case 13 — Southern Refinery

Same Motors More Power

AT A SOUTHERN refinery, drives originally applied to centrifugal pumps were 350 bhp, 600 rpm synchronous speed Westinghouse motors designed for 75 C rise. An increase in process loads demanded additional circulation from the pumps. That meant more powerful motors had to be installed to handle the load. Or did it? Extra power could be obtained in a simpler, less costly way with motor stator windings rebuilt by Westinghouse.

As a result of revising the motor windings, and using Dow Corning silicone insulation, motors now operate at 720 rpm synchronous speed with 115 C rise. They give the power that's needed and the refinery saved a substantial amount by having them rewound rather than replaced.

Silicones, because of their excellent heat stability, allow motors to work harder . . . give them more power per pound. According to Dow Corning, silicone insulation can up-rate horsepower as much as 50%.

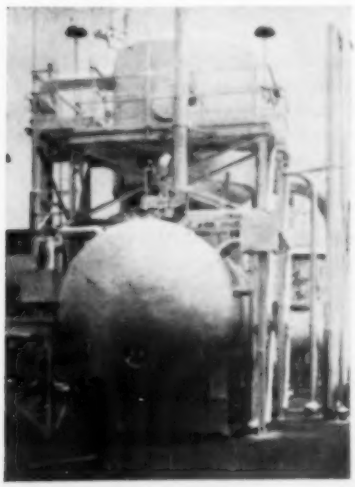
Case 14 — Georgia

Neoprene Coating Protects Outdoor Insulation

AFTER SEVERAL successful trial applications, starting December, 1955, the Georgia Power Company now uses GACO N-700-A Neoprene Maintenance Coating to weatherproof outdoor insulated surfaces at its plants. Areas coated include dust collectors, induced draft ductwork, induced draft fans, tanks, vent pipes and piping and tubing.

For the three year test, a three coat system was used to provide a moisture and weather seal and to prevent cracking of the insulation. The surfaces were given a first coat of black, a second coat of grey, and a third coat of aluminum. The three compatible colors of neoprene coating were used to assure complete coverage of each coat.

On one of the areas recently inspected, the coating has been in outdoor service for approximately 2½ years and still retains its original color and elasticity and has not cracked or peeled. GACO N-700-A is manufactured by Gates Engineering Company.



Case 15 — Texas

Centrifugal Compressor

THIS NEW "D" style scroll case, single-stage Allis-Chalmers centrifugal compressor is on lift air duty at an 8000 bpd cat-cracker plant at Sunray, Texas.

The turbine-driven compressor is rated at 47,500 cfm at 12.8 psia and discharges at 17.5 psia. It is capable of higher pressure ratios, greater volume and wider flexibility than previous models and is adaptable to the most advanced methods of sealing in industry today.

Case 16 — Florida

Geodesic Golden Bird Cage

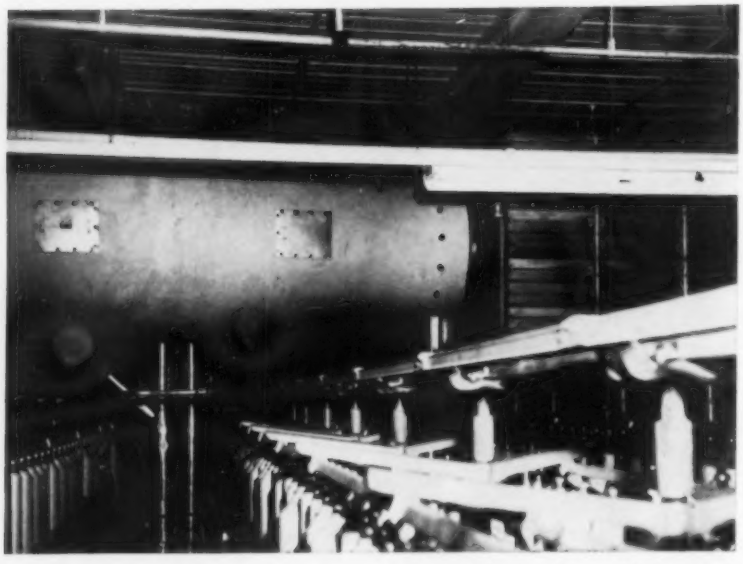
A UNIQUE geodesic space frame to house storks, cranes and other exotic birds has been constructed in Tampa, Fla. Designed, fabricated and erected by Graver Tank & Mfg. Co., the golden bird cage is 99 feet in diameter, 20½ feet high at its zenith and encompasses 7,700 square feet of ground area.

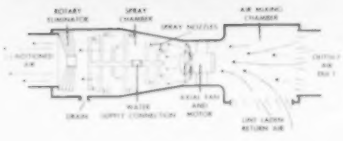
The Tampa "Graverdome" cost $75,000 including landscaping, walkways and lighting. It is constructed of gold anodized aluminum tubing, 3 inches in diameter and ⅛ inch thick. The circular structure is covered with a 2-inch square mesh, also of gold anodized aluminum. Aluminum for the project was supplied by Alcoa (Aluminum Company of America).

The huge bird cage was constructed for Anheuser-Busch, Inc., as a central feature of Busch Gardens, one of Florida's leading tourist attractions.

Case 17 — South Carolina Textile Mill

New Textile Air Conditioning System





Suspending the self-cleaning conditioner from the ceiling at Greenwood Mills, Greenwood, S. C., facilitated addition of new construction.

LINT-LADEN air is probably at its worst in a cotton mill. Filters, coils and sprays in vital air conditioning systems have to be cleaned a minimum of once a week, usually on the weekend.

Greenwood Mills, a large textile operation in Greenwood, S. C., has reduced its annual maintenance charges as much as 80 per cent by using the new Rotaspray Weathermaker System developed by Carrier Air Conditioning Company for textile mills and factories. It also cost 22 per cent less to install.

Modernization necessitated extension of the air conditioning system at Greenwood Mills, a periodic occurrence in the competitive textile industry. Conventional air washer equipment would have required construction of two apparatus towers, each three stories high, plus installation of extra long ducts. Total cost, $60,000.

Instead, units of the self-cleaning Rotaspray system, one-third the size of existing apparatus, were suspended from the ceiling of each department they serve. These features, plus better control of temperature and humidity, are part of seventeen important advantages provided by the Carrier Rotaspray over central air conditioning equipment which has had very few changes during the last half century. Greenwood reports: "We not only obtained a better system for less money, but cut maintenance by 80 per cent."

Here is the way it works: The new central air conditioning unit developed by Carrier Corporation for industrial plants occupies one-third the space of conventional equipment. The device was made practical through perfecting a rotating eliminator wheel which effectively halts water droplets and foreign particles, yet freely passes conditioned air. Water carrying sodden lint and dust drains to a common collection tank for all Rotaspray units where waste material is separated from water by a new kind of moving belt filter. The discharge water is then recirculated to the cooler and then back to spray nozzles. Spray nozzles with orifices capable of expanding to twice their normal size, also developed by Carrier, will not clog up.

Case 18 — Metal Processing

Demineralizer for Tin Plating Plant

ONE OF THE LARGEST tin plating plants in the country had previously employed condensate in the final rinsing operations in order to avoid any spots or other superficial defects caused by impurities in the rinse water. Recently the plating plant had to be expanded and there was insufficient condensate available. Therefore, a demineralizing plant was installed to produce the equivalent of the condensate for this purpose.

The plant consists of two parts:

(a) A coagulation plant, capacity 5800 gpm, to clarify river water through two Cochrane Solids-Contact Reactors 54'-0" in dia. This settled water is then used for the initial rinsing and other operations in the tin plating plant.

(b) A demineralizing plant, capacity 750 gpm to reduce the electrolyte to 5 to 10 ppm. This consists of: (1) A pressure filter plant for removing the residual turbidity from the coagulated water. (2) Four cation units using Cochranex CRW. (3) Four anion units using Cochranex AV.

The installation includes the following special features:

(1) Acid reclaiming. The excess sulphuric acid from the cation regeneration is recovered in a large lined tank and reused for the initial step in the succeeding regeneration. This saves about 20% of the acid otherwise required.

(2) Waste Water Neutralization. A complete automatic neutralizing system is included, which feeds lime into a reaction chamber following an equalization tank. The lime feed is pH controlled.

(3) Automatic operation. Rubber-lined valves are used on the front of each cation and anion unit. These are air-operated, controlled by cycle controllers on a large panel board.

Case 19 — Kentucky Power Company

First Super-Capacity Natural Draft Cooling Tower

A NEW AMERICAN milestone was reached in water cooling equipment for generator plant steam condensing when Kentucky Power Company selected a Marley-Mouchel Hyperbolic Natural Draft cooling tower for the new Big Sandy Plant near Louisa, Kentucky. The selection was made after engineers of American Electric Power Service Corporation, designers of the plant, completed a searching two-year study of the capabilities of this giant cooling tower.

In service the tower will supply 120,000 gallons per minute of cool water for the 265,000 kilowatt plant — dissipating over one and one-third billion Btu per hour. The tower will rise 320 feet into the air and will have a base diameter of 245 feet. While similar towers of Mouchel design are operating at many locations throughout Great Britain, Europe, South Africa and India, never before has the generating capacity required at Big Sandy been served by one tower.

Construction of the big reinforced concrete shell cooling tower will begin this fall and will require an estimated 18 months to complete. This will be the first tower of this type to be constructed in the western hemisphere. Design will be undertaken by L. G. Mouchel & Partners of London, and the tower will be constructed by the Marley Company of Kansas City, Missouri.

Some of the more important factors that influenced the selection of a Marley-Mouchel tower for Big Sandy station are: Service life is virtually unlimited — towers of this type are in excellent condition and are operating efficiently after 35 years of service. Hyperbolic natural draft towers permit more efficient utilization of plant site — they require less total real estate and can be located closer to other plant buildings than other types of towers, thus affecting both plant site and piping economies.

The only power required for operation of a Marley-Mouchel tower is for the circulating water pumps. No fans are required. Maintenance is minimum — it is not anticipated that any service operations will be required for many years. In many plants abroad a routine physical inspection is the only maintenance scheduled. High level discharge of moisture-laden air eliminates ground fogging and hazard to exposed equipment.

Operation of Marley-Mouchel towers is highly efficient, yet ultra-simple. The hot water is pumped into a peripheral flume from which it flows by gravity over layers of pretreated wood filling splashing into small droplets. The stack action of the tower causes a tremendous inrush of air through large openings at the bottom of the tower. Thus the exchange of heat from the falling water by evaporation into the upflowing air stream takes place. And this uninterrupted process goes on and on and on. The photograph of another tower shows approximately how the one for Kentucky Power Co. will look.

Case 20 — Georgia Textile Mill

Glass Panel Heaters Fuse Textile Coating

UNIFORM HEAT is required in fusing a vinyl plastisol coating on the back of tufted fabric at the Proffitt Textile Company, Inc., Dalton, Ga. The operation requires a quick heat source, producing a minimum of 350 F.

Pyrex brand industrial radiant heaters are doing the job.

An installation of 15 self-contained heaters, each 16 by 24 inches in size and producing 3500 watts, provides a 36-second exposure to the fabric, 40 inches wide and run through in rolls 400 feet long.

Each heating unit consists of a tempered glass panel coated with an electricity-conducting film and mounted in an aluminized steel frame. The electroconductive film serves as a resistance element and heats the glass panel. When electric current is applied to the film the entire glass panel heats and emits long wave radiation.

Between 85 and 90 per cent of the radiant energy is directed right at the work. At Proffitt, the material moves beneath the battery of heaters at 16 feet per minute. Distance from heaters to work is two inches.

A fan blows room air on the underside of the material, keeping it relatively cool while it is being heated on the top.

Proffitt reports that these radiant heaters, manufactured by Corning Glass Works, provide clean, fast, even setting of the plastisol backing without damage to the fiber.

Case 21 — South Carolina

New Boiler Provides More Power With Less Fuel

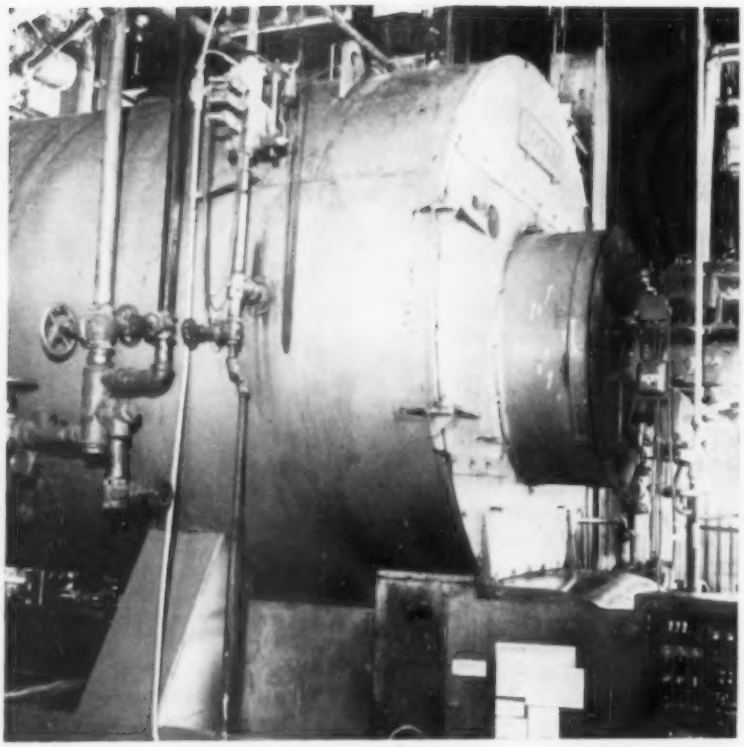
A NEW 600 HP oil fired boiler installed at Jefferson Bleachery, Jefferson, S. C., last March has cut fuel cost in half. Replacing two 145 hp boilers which consumed 2,700 gallons of No. 6 fuel oil in 24 hours, the new boiler uses about 1,900 gallons in 24 hours with a much heavier load.

Operating at 125 psi, the boiler supplies steam for the entire finishing plant. Most of the steam is used to heat water for dyeing, bleaching, and soaping of knit goods. A large hot air dryer (65 ft long) is equipped with 125 hp heater for drying goods in continuous strand at temperatures up to 340 F.

Fully automatic in operation, the new boiler requires no operator or constant watch. Formerly, one man on each shift was required to operate the two old oil fired boilers, and these men did nothing else but watch the boilers. Now no boiler operator is required; however, the maintenance superintendent is responsible for the boiler, and a mechanic keeps casual watch. Watchmen are employed on weekends for insurance reasons.

Oil savings amount to about $16,000 per year, and added to labor savings this would amortize the investment in about 1½ years. The new boiler takes only half as much space as the two old boilers.

Better quality and production result from the new installation, according to the mill officials. This improvement is attributed to the fact that the new boiler makes drier steam which helps increase temperatures and provides more uniform heat throughout operations.



This new 600 hp boiler is entirely automatic in operation and occupies only half as much space as the two 145 hp units it replaced.

The 600 hp boiler has a much greater potential than is used at present, being capable of burning about 180 gallons of fuel an hour. Current consumption is in the range of 115 gallons an hour.

An expansion program at the bleachery further emphasized the need for a more efficient boiler of greater capacity to take care of expanding demands. Supplied by Superior Combustion Industries, the new boiler has exceeded expectations, according to C. Wilson Boshamer, general manager of company operations at Jefferson.

Case 22 — Tennessee Hospital

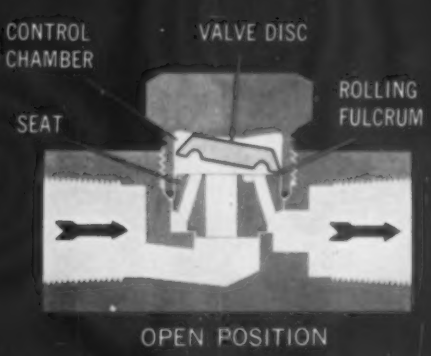
Concrete Walls Demolished

THE POWDER-LANCING process, developed by Linde Company, was chosen to burn down the outer walls of the Jackson-Madison County General Hospital in Jackson, Tennessee, as part of a construction job involving the building of two new wings.

The powder-lancing process is simple. Lengths of ordinary black iron pipe are fitted into the end of the powder lance which is connected to an oxygen supply and a source of special Oxweld metallic powder. The oxygen and metallic powder are mixed in the pipe and carried through the pipe to the material being pierced or cut. This mixture is ignited at the end of the iron pipe, producing an extremely high temperature reaction that melts concrete and other nonferrous and ferrous materials.

Although the use of the new torch is slightly more expensive than the conventional machines which drill away the concrete, hospital authorities feel that it is money well spent to eliminate noise and the jarring vibration. Several thousand cubic feet of wall had to be removed to connect the new wings to the existing building. This would normally require about 60 days of jackhammer cutting with its attendant noise.

Do your steam traps give you these 3 advantages?



1. Economy of operation on light loads?

The Yarway No. 30 gives you closer control—discharges condensate at full capacity, closes immediately on steam.

2. Longer service life?

Yarway's lever action reduces impact on valve seat—lessens wear, gives longer operating life. Quieter operation, too!

3. Lower maintenance?

Only Yarway offers an Impulse trap with renewable seat and disc that *can be replaced without removing the trap from the line.*

Why settle for less? Get all three money-saving advantages with Yarway No. 30—plus these time-proven advantages of all Yarway Impulse traps: quick heat-up, even temperatures, small size, stainless steel construction, non-freezing.

Nearly 1,300,000 Yarway Impulse traps already installed. Stocked and sold by 270 Industrial Distributors. Ask *your* distributor to arrange a free 90-day trial in your plant. Or write us.

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Home Office: 116 Mermaid Ave., Phila. 18, Pa.
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YARWAY
A MARK OF QUALITY IN STEAM ENGINEERING

Case 23 — North Carolina Power Plant

Determining Strength of Acid in Heater Washing Solution

WE CLEAN OUR OWN feedwater heaters using muriatic acid. One of our problems was how to determine the strength of the solution at the site of heater cleaning by personnel doing the cleaning.

A sample could be analyzed in the laboratory, but this was time consuming and required laboratory facilities. Frequent testing at the site of the cleaning was important, because acid strength continues to decrease as long as it is reacting with the oxide in the heater tubes. Most of the oxide has been removed when the acid strength levels off. Additional acid is sometimes needed to maintain sufficient strength for proper cleaning (7-10%).

Our problem was met by preparing a curve in the laboratory using muriatic acid diluted to give strength of 10%; 5%; 2½%; 1¼%. The total diluted volume in each instance of dilution was 100 ml.

A strong caustic soda base was prepared by dissolving a quantity in water until no more would dissolve (approximately 365 grams, in 500 ml of water). This solution was then filtered to remove excess solids. No external heat should be applied, as the reaction of the caustic in water generates heat. Extreme care should be exercised in the preparation of these chemicals.

Methyl purple indicator was added to each of the prepared acid solutions until a good red color developed. The caustic soda solution was used to titrate to end point. A curve was then developed based on ml of titration vs strength of HCl. The number of ml of titration needed to neutralize known strength of acid established a point on the curve. A series of points derived by using the dilute acid volumes established a straight line curve which could be used to determine strength of acid at site of heater cleaning.

A quantity of liquid is collected while solution is in circulation in the heater and filtered. A 100 ml sample is taken in a glass flask. Methyl purple (25 drops) is added; the sample turns red. The caustic solution is then added until the sample is neutralized. It turns a greenish blue color. It is helpful to use pH paper to indicate when the solution is neutralized. The per cent strength of HCl may be read from the curve when the number of ml of caustic solution needed to neutralize the sample is known.

The only chemicals needed for this work are the HCl solutions, the methyl purple indicator, and the saturated caustic soda solution. Apparatus will include an Erlemeyer flask, a 100 ml graduated cylinder, a 10 ml pipette, and a polyethylene safety pipette.

The pictures show chemical tank and pump used to clean feedwater heaters and test being made to determine strength of the acid solution.

By ROLLA C. NELSON
Wilmington, N. C.

Case 24 — Tennessee

Cooled Bearings

A SOUTHERN metalworking plant had a high temperature problem on the heat treating units of a salt bath operating at 900 F. The actual circulating heat rises to 1300 F. The units were mounted on ball bearing pillow blocks of a standard manufacture and lasted approximately 90 days.

The old bearings were replaced by specially designed water cooled, oil lubricated pillow block bearings and have now been in operation over a year with no apparent trouble. The new bearings were furnished by Dixie Bearings, Inc.

Case 25 — Texas Manufacturer

Continuous Proportioning — Better Brick

THE BRICK MANUFACTURER is becoming convinced rapidly that he must have closer control over characteristics of his product. Besides producing a high quality product he insists upon equipment with the ability to reproduce previous shipments in color and quality.

Many brick plants have installed Jeffrey "Waytrols" (weigh-feeding device) and vibrating feeders to solve the problem of accurate continuous proportioning of raw materials. One large plant in Texas installed 21 Waytrols arranged in three lines of seven — each line feeds a collecting belt and the three belts go to three pugmills. The Waytrols replaced volumetric feeders and are doing an outstanding job.

In this operation special clay hoppers were designed by Jeffrey and are recommended for other plants in the industry. The hoppers (see photo) have relatively steep sides as well as large openings at the bottom because the clays are sticky and lumpy. This large bin opening and heavy bin load necessitated a wider than normal feeder deck and a larger power unit. The customer provided gas heat under the decks of the clay feeders and also on the sides of the feed hoppers. Electrical heater strips could be used if desired.

Six of each group of seven weighbelts are fed by 33" x 78" Jeffrey electric tapered deck vibrating feeders designed for clay handling. One in each group is fed by a standard 18" x 30" feeder since the material is not sticky.

The main control panels are located remotely in clean control rooms. At each machine, however, there is a small dust-tight operator's station with individual start-stop and indicating pilot lights. There also are three small master stations, one for each line to provide group start-stop and alarm pilot control, a unique set-up.

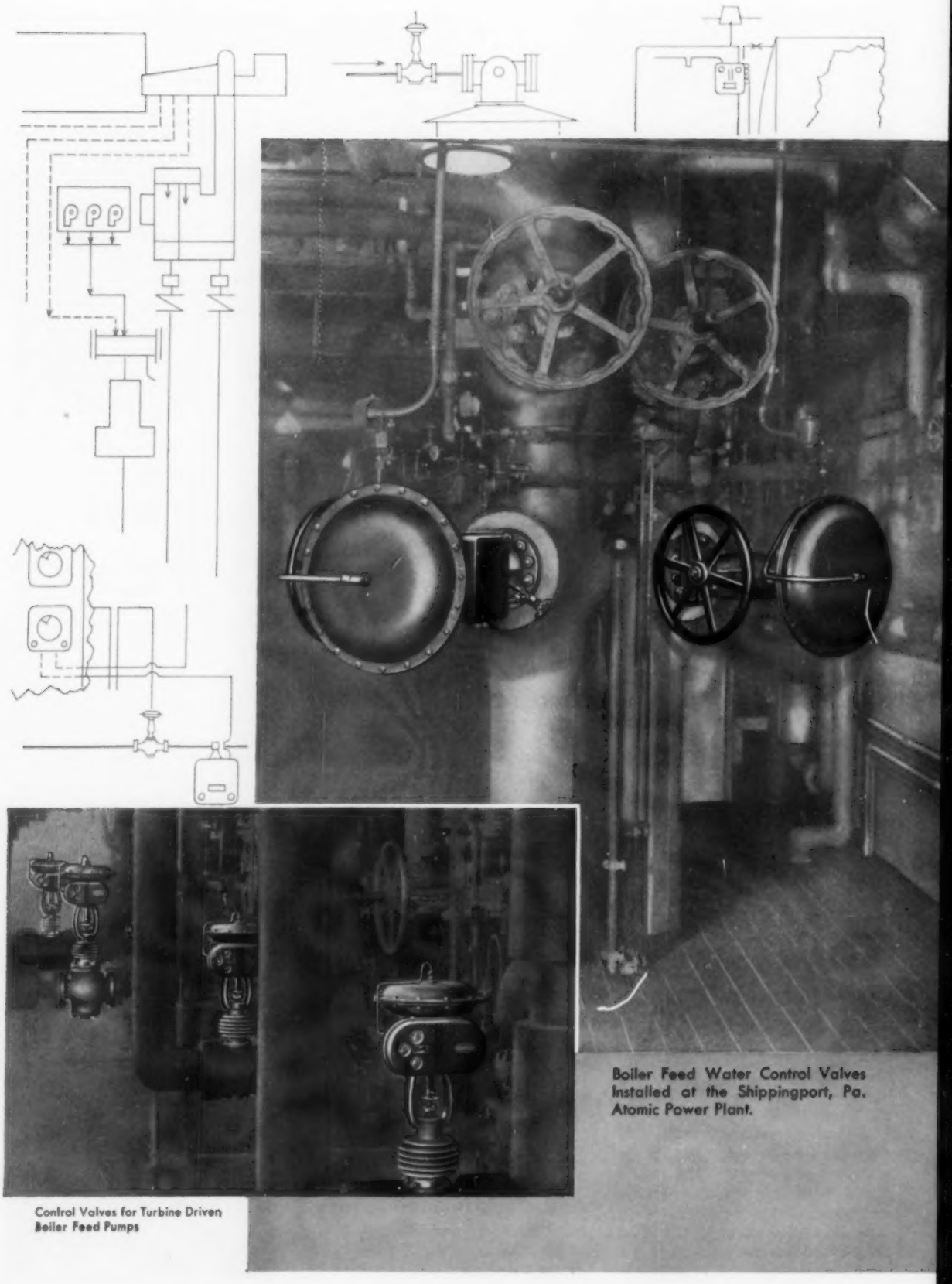
The ceramic engineer can set up a formula for each type of brick and can be sure of consistent high quality products.

Case 26 — Texas

Surface Grinder Improves Weld Quality

ONE OF THE WORLD'S largest pipe fabricating and welding shops developed a special fixture for beveling pipe ends for welded fabrication. This Texas concern had originally used a cutting torch mounted on the special fixture to bevel the pipe. Subsequent X-ray examination of welded joints showed that this technique was not up to their high standards. Cleaner, more accurate beveled ends were required to obtain a sound weld. It became apparent that grinding the bevel was the best way to do the job.

Grinding the bevel on heavy alloy pipe requires rapid removal of substantial amounts of metal. A powerful grinder is required to efficiently bevel the pipe. The particular grinder used, manufactured by Ingersoll-Rand Co., is a heavy-duty, Multi-Vane Surface Grinder, Size 41F60. This unit operates at 6000 rpm with a 6-inch diameter cup wheel. The grinder is mounted on the fixture initially designed for the cutting torch. A uniformly ground bevel is obtained by rotating the I-R grinder 360 degrees around the flange.



Boiler Feed Water Control Valves Installed at the Shippingport, Pa. Atomic Power Plant.

Control Valves for Turbine Driven Boiler Feed Pumps

VERSATILITY OF STANDARD MASONEILAN CONTROLS

Key to Dependability and Economy in Power Plant Operation

The wide variety available in standard Masoneilan Controls, plus adaptability to special conditions (often through interchangeability of unit sub-assemblies), simplifies the selection and maintenance problems of engineers concerned with power generation and power services. For example: —

CONTROL VALVES . . . body and trim types are designed to permit a maximum of interchangeability; full or reduced capacity; with percentage or linear characteristics as required. Advanced design butterfly types are also available with wide choice of actuators, and soft and angle seating.

LEVEL CONTROLLERS . . . units for proportional, proportional-reset, differential-gap control, or for pneumatic transmission, or combinations of any two of these in a single case. Also a complete variety of vessel mounting types.

PNEUMATIC CONTROLLERS . . . non-indicating, indicating and recording instruments for controlling pressure, temperature and flow. Features include unit sub-assemblies for wide choice of function and variety of action.

TRANSMITTERS . . . for pressure, temperature, flow and level, providing accurate remote measurement and pneumatic transmission; featuring a number of exclusive advantages.

Versatility designed into standard Masoneilan products helps to achieve accurate, dependable control with simplicity and economy. It can be profitable to you.

For details call a Mason-Neilan representative, or write:

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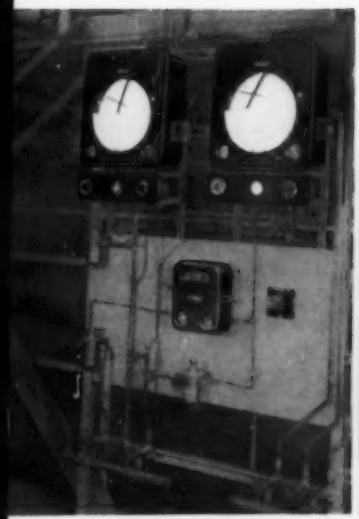
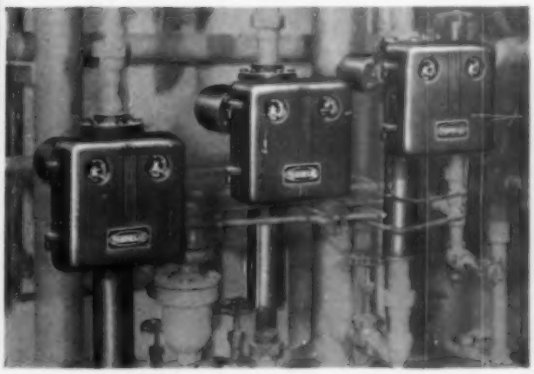


Pressure and Temperature Controllers



Level Controllers on Condenser Hotwell

Control Valve in Feedwater Starting Service

MND-51

Whatever your needs in metals...rod, wire, sheet, strip...it will pay you to specify metals by Chase. They're produced to the highest standard of quality, on the most modern equipment in the industry. And Chase skill and experience will help you pick the alloy to make what you make better.

Chase

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Subsidiary of ***Kennecott Copper Corporation***

THE NATION'S HEADQUARTERS FOR ALUMINUM, BRASS, BRONZE, COPPER, STAINLESS STEEL AND FORGINGS.

Case 27 — Georgia

Simplified Procedure

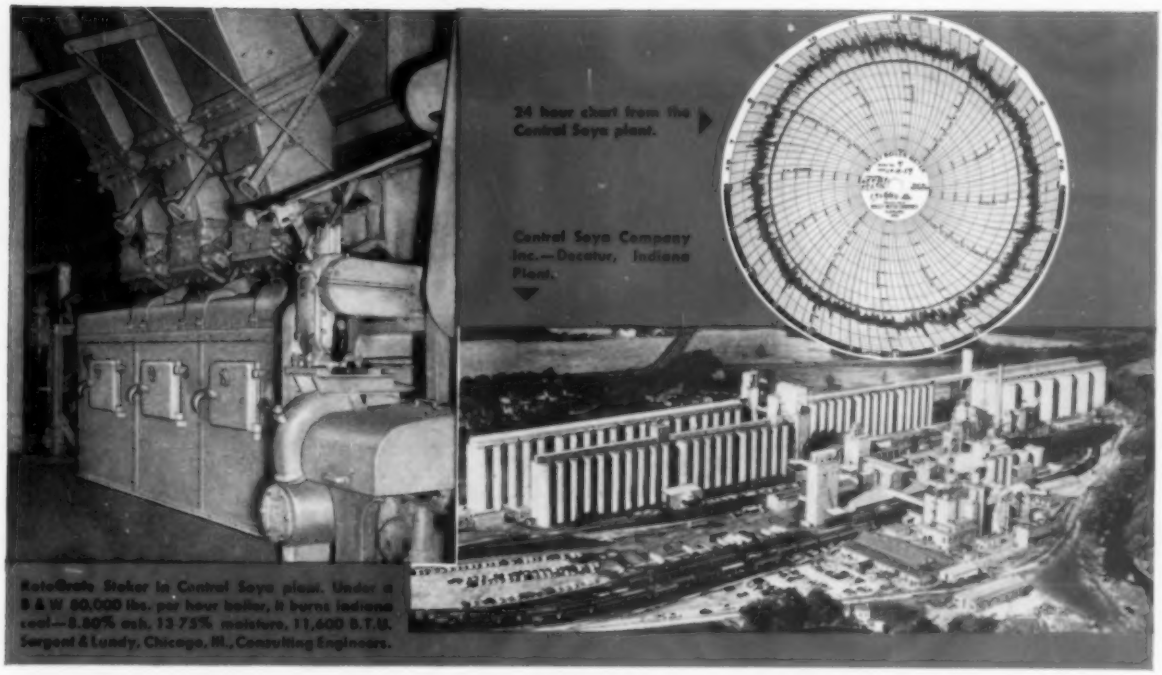
SIMPLIFIED manufacturing process along with cost improvement were the goals of this project. Transformer tank covers used to be made in the following manner: Shear to size, burn manhole and bushing openings, burn out of heavy plate steel manhole and bushing flanges to go around the openings, machine the flanges, drill and tap holes in the flanges for cover mounting and then weld these flanges to the tank.

Engineering and Marketing were consulted as to the requirements for this flange design and would it be acceptable in another manner? The answer was positive, a surplus hydraulic press was available, and development was started. With Engineering's help the number of sizes of openings required to be burned into the cover was reduced approximately in half, forming dies were made for the hole size requirements, and the hydraulic press was put into use on the new process.

Our covers are now made by shearing the plate to size, burning the openings and cold forming the flanges required around the openings in the hydraulic press. Nelson studs are used on the cold formed flanges for cover mounting, thus eliminating the heavy machined flanges and hardware previously required. The cycle to form the flanges is now approximately 15 minutes and the over-all saving was approximately $60,000 per year in material and labor.

By T. J. NARY, Manager
Manufacturing Engineering
General Electric Company
Rome, Georgia

See pages 87 & 88



8 Years of Stoker Operation Without Forced Outage

DETROIT ROTOGRATE AVAILABILITY AT CENTRAL SOYA COMPANY INC.

Hersel Nash, Steam Power Superintendent of Central Soya Company, Inc., Decatur, Indiana Plant says: "Our 80,000 pounds per hour, 600 psig boiler with Detroit RotoGrate Stoker has carried loads similar to the accompanying chart for 355 days per year for eight years (we have the boiler down for inspection and cleaning once each year, for about 10 days.)"

"During this time we have burned about 300,000 tons of Indiana coal without ever losing the load because of the stoker. Our monthly efficiencies average 85% to 86%. This is above the manufacturer's predicted performance."

This 'round the clock—seven days a week operation year in and year out with high economy proves the rugged stamina and ability of the RotoGrate . . . shows why it has long been first choice among operators and top management alike.

Built to serve steam generators up to approximately 400,000 pounds steam per hour capacity, the RotoGrate is one in a complete line of Detroit Stokers . . . overthrow spreader and underfeed types for commercial, industrial and utility boiler plants—also for incineration of both municipal and industrial wastes.

DETROIT STOKERS COST LESS Cost equals initial investment plus upkeep, plus production losses due to equipment outage. *The total is less with Detroit.* Ask for Bulletin.

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For fuses with 200,000 ampere interrupting capacity...

***plus,* extreme current-limitation**

plus,* time-lag to prevent needless blows – *you need . . .

Buss LOW-PEAK fuses

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When it's steel pipe . . .

. . . you're buying pipe with inherent strength and safety. Steel pipe is easy to thread, bend and weld . . . saves you installation time, helps keep construction costs down.

And when you install a steel pipe job, you *know* from experience that it will provide years of satisfactory, trouble-free service. Reliable steel pipe is first choice always for plumbing, air conditioning, steam and radiant heating systems, snow melting, refrigeration, ice rinks and structural uses.

When it's SPANG Steel Pipe . . .

. . . you're buying steel pipe with the *top-quality* reputation. Spang pipe is closely controlled during manufacturing and is thoroughly tested and inspected before shipping.

And when you order Spang, you *know* you're getting top-quality, the best available! Today, you'll find Spang Steel Pipe providing *top-quality* service in thousands of installations in schools, hospitals, industrial plants, office buildings, hotels, apartments, homes and many other types of buildings.

Get the complete story . . .

. . . of Spang Steel Pipe from our new Bulletin No. 509. It describes how Spang is made, shows many typical Spang installations, and contains valuable technical tables. We hope you'll write for a copy.

Meanwhile, your local Spang Distributor is at your service for all your piping needs. Next job, remember for best results: make it Steel Pipe . . . make it Spang! Made in the U.S.A.!

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2000 Pounds Cold, W.O.G.

Available from stock in ¼" thru 2" sizes and in both socket weld and screw ends.

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1. Forged steel pressure containing parts designed for light weight and brute strength.
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Vogt VALVES & FITTINGS

FORGED STEEL

VALVES

Case 28 — Southern Metal Fabricating Plant

Infra-Red Heating Combines Comfort and Economy

A LARGE Southeastern metal fabricating and tank corporation, whose manufacturing area contains 130,000 square feet, had been heating for several years with coke salamanders. In spite of the inadequacy of the heating system with the salamanders, the coke bill ran approximately $15,000.00 per year.

While the main part of the plant could be heated with this type of equipment, one department which is completely open at one end raised problems for the air moving unit heaters. It was found that to adequately heat the entire plant area it would be necessary to install approximately 1,000,000 Btu capacity and the cost would be $55,000.00. The fuel cost would also be exorbitant.

With Panelblocs it was discovered that only one-half of the Btu quoted above or 510,000 Btu would have to be installed. It was also discovered that this installation of Panelblocs would only cost the company $33,000.00. This is due, primarily, to the following points:

Panelblocs are extremely light in weight, and therefore easy to hang in proper position. No electrical connections are required. This reduces installation costs and, naturally, there are no electrical costs in the operation.

In addition to the money savings in the installation, the open-ended department would be extremely comfortable for the personnel in that area. Panelblocs generate long wave length infra-red and are, therefore, oblivious to cold air and drafts. Infra-red energy does not become heat until absorbed by the target materials.

Since air is a very poor absorber of infra-red energy, the air blowing in and out of this department would remain at approximately the outdoor temperature so that very minor heat losses would result. While the personnel standing in these drafts would require additional intensity of infra-red energy to remain in a comfortable condition, the installation of the additional Panelblocs to fulfill this requirement was still far less than the cost of the unit heaters required to overcome the vast volume of air coming and going through the open end.

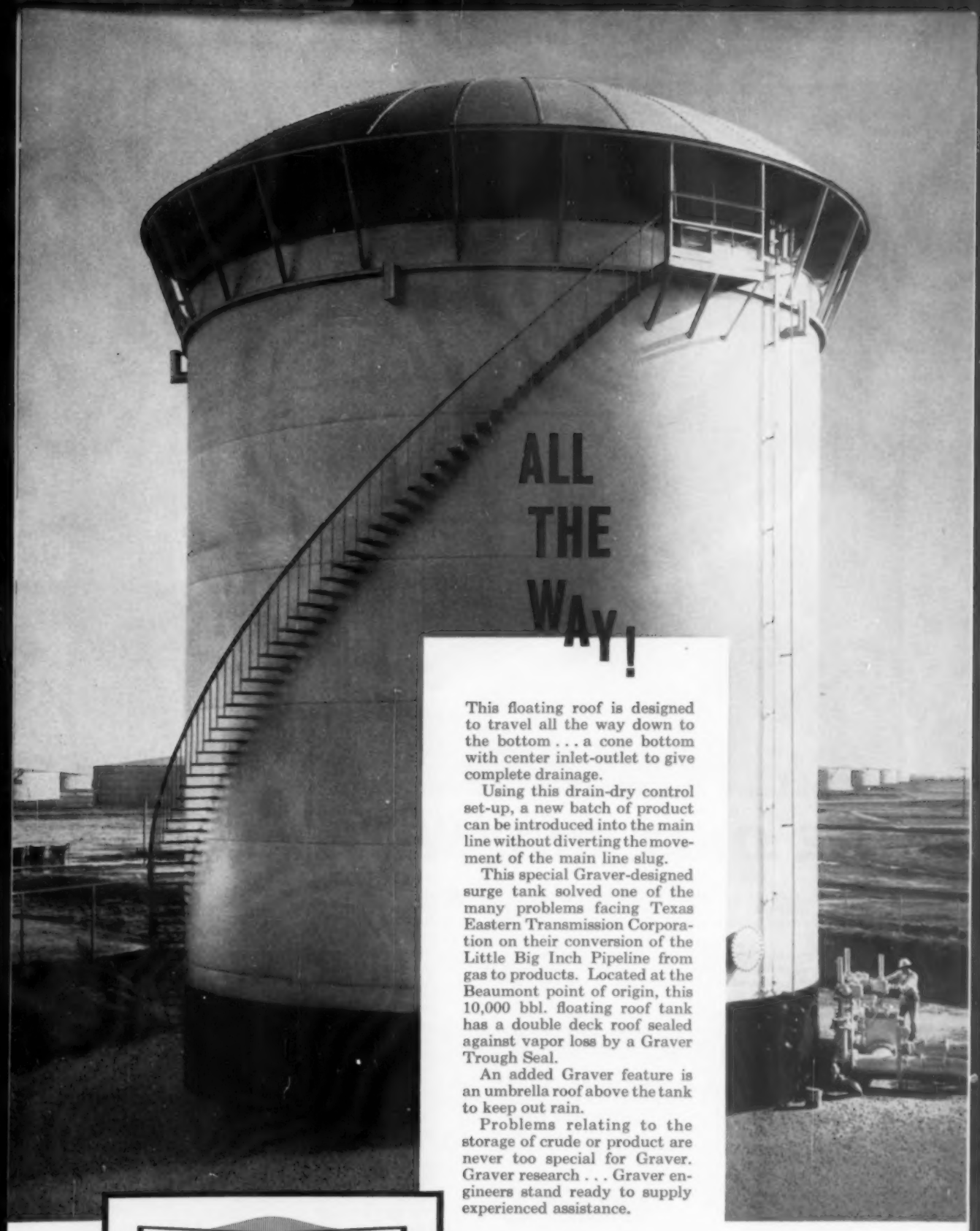
Another important consideration in infra-red heating is the fact that the floors and machinery are the first to be warmed and become secondary sources of heating.

Because of the above mentioned points, the management of this fabricating company decided that (51) CR-125 Panelblocs should be installed. They also decided that each should be equipped with a thermostat to provide individual temperature control. Consequently, only that number of units required to match the heat loss at any particular time will be in operation.

Because most of the departments in this building had overhead crane rails, it was necessary to install the heating units between the crane rail bays so that there would be no interference in the operation of the cranes. In the open-ended department where the entire area is covered with a crane rail, it was necessary to hang them against the wall with flat bright aluminum shields behind so that the entire output was reflected and radiated into the working area.

Since the installation of these infra-red generators, many man-hours have been saved. The operating personnel are completely warmed at their working stations. This particular fact is true even in the completely open-ended department.

Many of the workmen were skeptical of the Panelbloc before its installation because of its lack of visible flame and blowers. Since the installation, they have commented to the manager that they have never been so comfortably warm while at work. Of further interest to management has been the fact that through the first winter of operation the gas bill has been approximately $10,000.



This floating roof is designed to travel all the way down to the bottom . . . a cone bottom with center inlet-outlet to give complete drainage.

Using this drain-dry control set-up, a new batch of product can be introduced into the main line without diverting the movement of the main line slug.

This special Graver-designed surge tank solved one of the many problems facing Texas Eastern Transmission Corporation on their conversion of the Little Big Inch Pipeline from gas to products. Located at the Beaumont point of origin, this 10,000 bbl. floating roof tank has a double deck roof sealed against vapor loss by a Graver Trough Seal.

An added Graver feature is an umbrella roof above the tank to keep out rain.

Problems relating to the storage of crude or product are never too special for Graver. Graver research . . . Graver engineers stand ready to supply experienced assistance.

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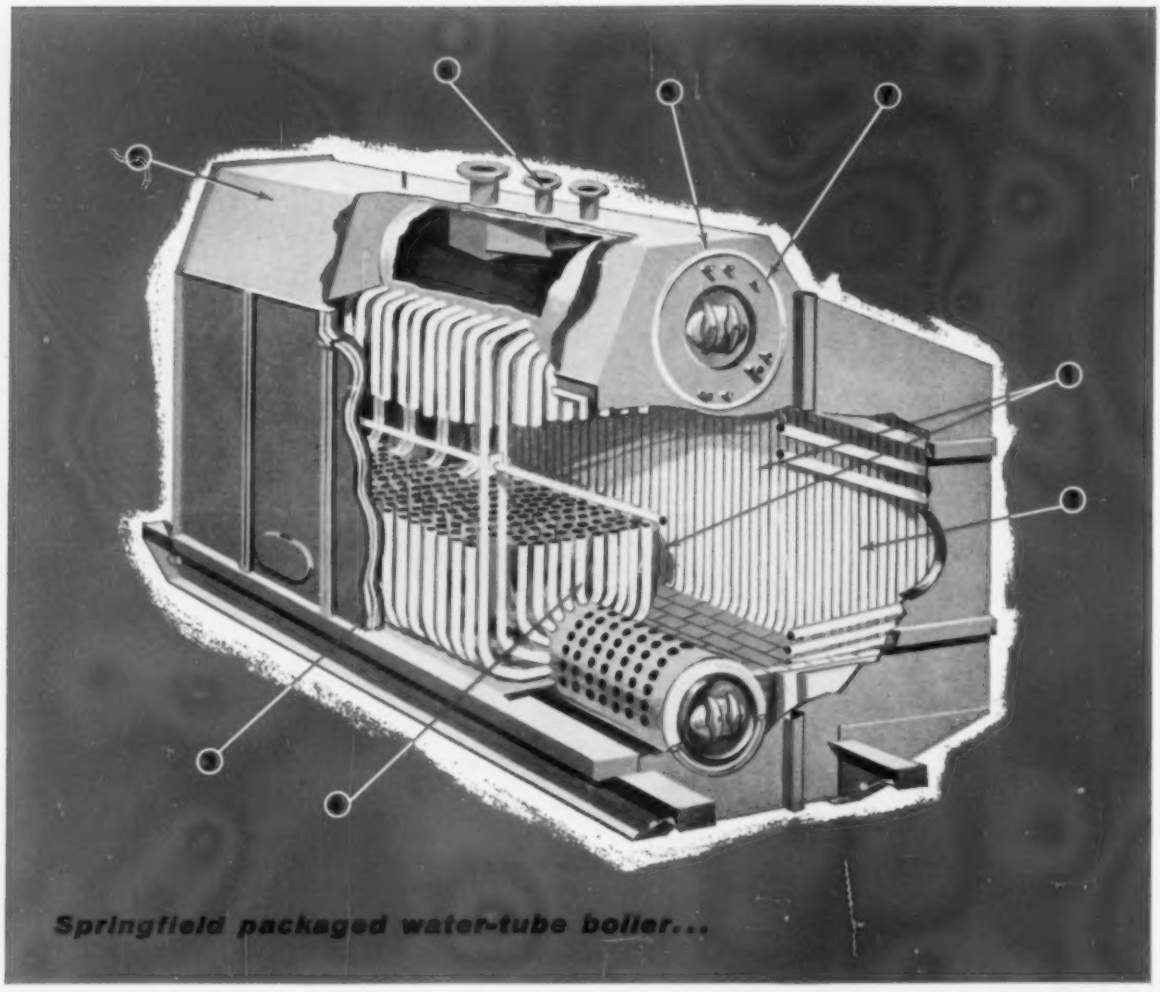

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2. **SIX-WALL FURNACE COOLING.** Water tubes on all surfaces — top, bottom and four sides — receive the heat. This keeps casing temperature down. A double row of tubes protects the rear wall of the furnace.
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4. **MOST EFFECTIVE TUBE ARRANGEMENT.** Staggered tubes in the convection zone direct hot gases into a turbulent pattern for maximum heat transfer. Wide/narrow rows provide full accessibility to every water tube.
5. **UPPER DRUMHEADS FULLY INSULATED.** Another job-site expense item eliminated. Factory-applied casing covers drumheads. You avoid the cost of field-applied insulation.
6. **A MANWAY IN EVERY DRUMHEAD.** Springfield stresses operator safety with these extra manways for maintenance, inspection and cleaning — included at no extra cost to you.
7. **WELDED, GASTIGHT EXPANSION JOINTS.** Another Springfield original and exclusive feature. These unique, fully welded expansion joints absorb both horizontal and vertical expansion stresses — eliminate costly casing maintenance.
8. **UNIQUE STEAM SEPARATOR.** Developed by Springfield engineers for large central station boilers, then adapted for the "D" type boiler, this steam separator assures continuous dry steam for the life of the boiler.
9. **TOTAL BOILER SERVICE.** Your boiler investment is safeguarded by service that begins with advanced design and engineering, through factory testing, and carries through to factory-authorized starting service to assure you of maximum operating efficiency.
10. **TOTAL BOILER EXPERIENCE.** Springfield's 70 years of experience in the water-tube boiler field plus Cleaver-Brooks' leadership in the packaged fire-tube boiler field are back of every boiler produced, every recommendation made. You can contact Cleaver-Brooks, with confidence, for answers to *any* boiler problem.

We offer packaged water-tube boilers and field-erected units to meet your required capacities.

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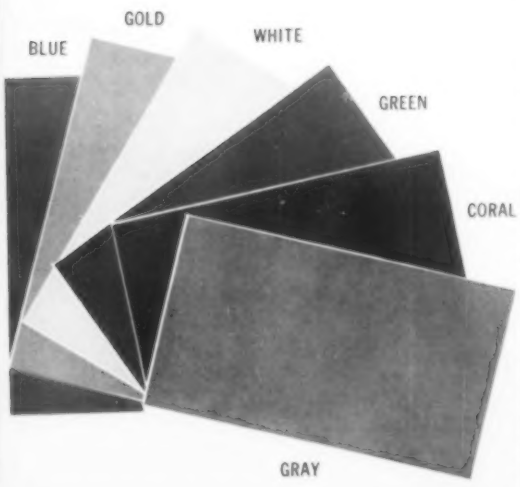
PERMA-COLOR PANELS

add New Beauty and Versatility to DIXISTEEL BUILDINGS



Your DIXISTEEL Building can be as bright and beautiful as you want it. Six modern, compatible colors offer unlimited opportunities in style and appearance. And the distinctive design of DIXIRIB Panels takes full advantage of light reflection and shadows to further enhance the beauty of DIXISTEEL Buildings.

DIXIRIB Perma-Color Panels are roll-formed from 26-gauge galvanized coiled sheet. They are 100% plumb and true every time, fit together easily and perfectly. The two-coat, baked-on vinyl enamel finish will last for years—resists corrosion, weather, rust, and abrasion.

DIXISTEEL Buildings offer you a low-cost, quick way to have a modern, colorful building for any purpose. Get the facts from your nearest DIXISTEEL Building dealer, or . . .

TEAR OFF AND MAIL THIS COUPON FOR FULL INFORMATION

☐ *Yes!*

Please send me data and information on DIXISTEEL Buildings

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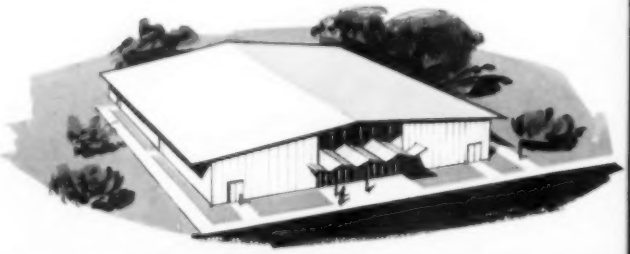
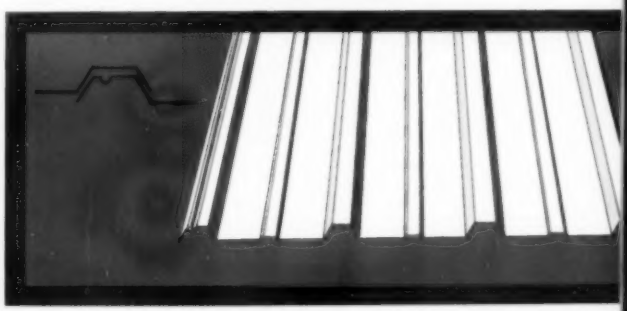
Any type or style of building . . . all clear span . . . full length

There are 183 basic designs in the DIXISTEEL Building line from which any combination can be made to provide buildings of any size or type, with either standard 4:12 or Lo-Line 1½:12 roof pitch. All are clear-span, free from columns or posts. Standard lengths are based on *inside dimensions* to provide maximum interior floor space and simpler adaptations for masonry fronts. There are many outstanding features your DIXISTEEL Building dealer can tell you about.

CHEAPER THAN RENT—LOW COST FINANCING AVAILABLE

DIXISTEEL Buildings cost so little, more often than not it is cheaper than renting. DIXISTEEL Building dealers can arrange for complete financing at low cost with as little as 25% down and the balance payable over a period of 10 years.





The distinctive design of DixiRib Panels not only adds to the beauty of DIXISTEEL Buildings, but provides greater strength and rigidity, and improved drainage. Ribs are one-third higher than previously. Wall panels can be any length, and roof panels up to 20 feet, eliminating unsightly overlapping. An improved drain groove in the side lap provides drainage of moisture created by capillary action.

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ATLANTIC STEEL COMPANY
ATLANTA, GEORGIA

Case 29 — Texas Chemical Plant

Motor Maintenance Reduced

THE GENERAL Tire & Rubber Company, Waco, Texas, reduced maintenance costs on a large 500 hp Banbury mixer motor and a 50 hp mill drive motor by allowing only absolutely clean air to cool them. This was accomplished by shrouding the motor and providing a closed cycle of super cleaned cooling air with a special filtering unit.

Air that enters the motor is filtered through a Wheelabrator air filter that removes all atmospheric dust. A standard Wheelabrator cloth tube-type dust collector, with a special filter aid, is utilized for this application.

The clean air is ducted to the motors under slight pressure, thus preventing dust from entering the air stream, even if a small leak should develop. Since this air is the only source of ventilation, a pressure switch is inserted in the duct so that the contacts are closed when the filtration unit blower is functioning properly and the discharge duct and motor is under pressure. The pressure switch is connected in series with the control circuit (start button) of the motor controller. Therefore, the motor cannot be started until proper ventilation is supplied, and failure of the ventilation system to supply sufficient air will also stop the motor.

Case 30 — Florida Power Corporation

Electric Counters Help Control Maintenance

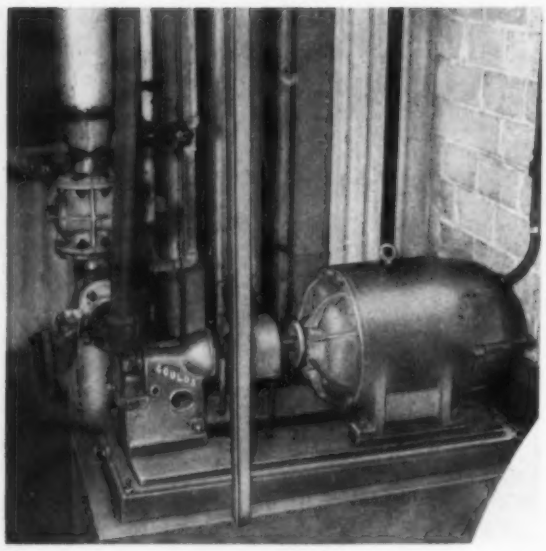
ELECTRIC COUNTERS are installed in the main control room of the Bartow plant of Florida Power Corporation to accurately count the number of times various circuit breakers are opened and closed.

Two counters record the opening and closing of the circuit breakers on the main generators; and others record the operation of various circuit breakers throughout the plant and substations.

The counters are mounted in relay cases and are actuated by the "b" auxiliary switch in the circuit breaker. This switch closes and records one count when the breaker is open.

These counters enable the operators to determine, from the Central Control Room, how many times during any given period the various overload circuits have automatically been thrown in, and also play an important part in the maintenance of the circuit breaker contacts. The push button reset enables the operator to quickly reset the counters when necessary.

These Durant Manufacturing Co. "YE" counters, with speeds up to 1,500 counts per minute, are also widely used with electric computers, card and check sorters, electronic scalers and mailing equipment, photo-electric and remote control counting instruments and production machinery.



Case 31 — Florida Paper Mill

Slurry Handling Improved

KAOLIN is a very fine clay used extensively for coating and filling paper. It is also used in the manufacture of paints, ceramics, adhesives and other materials.

With over 1,000,000 tons used annually by the paper industry alone, the techniques for handling clay are of vital interest to paper mill operators. The trend today is to ship and handle this clay in slurry form. This is in contrast to the former methods of shipment in bags, or in bulk form by box or hopper car.

Shipment in slurry form by tank cars produces economies in both transportation and handling costs. Additional savings are also made in storage space and in dispersing the clay to the mixers as the clay for both paper filling and paper coating is almost always converted to an aqueous suspension.

In order to realize the cost advantages of tank car shipment and also to eliminate any need for concentrators at the point of usage, the solids content of the clay slurry must be at least 70%. With a slurry of this high concentration of solids, the specific gravity and viscosity must be carefully controlled or the slurry will be exceptionally difficult to handle. Further the pH value must be within certain limits or additional difficulties are encountered.

Considerable research has been done on these factors by the suppliers of Kaolin and the slurry as received in the tank cars is pumpable, if care is exercised in the selection of the proper type of pump for this service.

Goulds end suction, open impeller centrifugal pumps have proven ideally suited for this tough pumping service.

A typical installation of these pumps on Kaolin clay service is at the Pensacola, Florida Mill of the Kraft Division of St. Regis Paper Co.

A 4 x 6-13 unit rated at 500 gpm against 60-ft head is utilized as a tank car unloading pump. Three 3 x 4-11 pumps serve as transfer pumps and have a capacity of 50 gpm against 45′ head.

All pumps handle 70% clay slurry with a viscosity of 1050 SSU and specific gravity of 1.76. Pumps are in all iron construction and operate at 1150 rpm. It is recommended that pumps for this service do not operate at speeds higher than this.

The pumps at St. Regis have been in service well over a year and according to latest reports are proving entirely satisfactory for this rigorous service. The larger pump can empty a 10,000 gallon tank car in 18 minutes.

Case 32 — South Carolina

Stainless Steel Enclosed Starters

STAINLESS steel enclosed NEMA 4 combination starters save money for Mr. Bill Oates of Rock Hill Printing & Finishing Company, Rock Hill, South Carolina.

Mr. Oates estimates the Square D stainless steel enclosures he is now using will outlast five to one the previously used general purpose enclosures in areas subject to corrosive atmospheres.

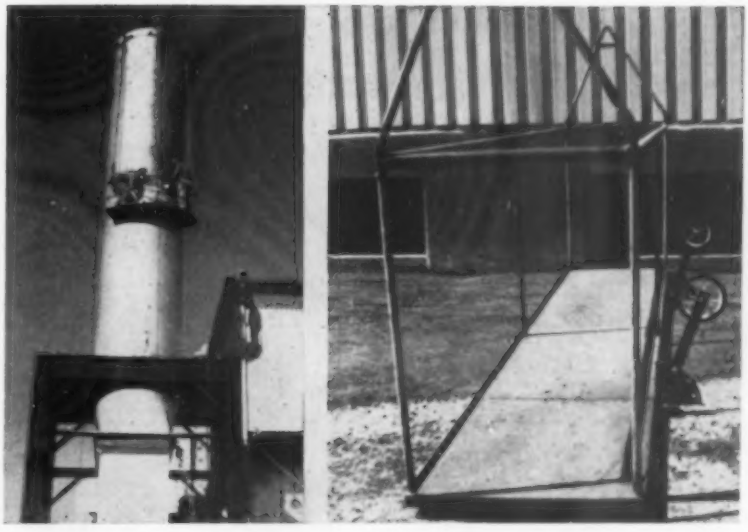
Where NEMA 4 cast enclosures have been necessary, the new stainless steel enclosure also has the advantage of being lighter in weight and it has conduit access through hubs at customer choice of location, both of which mean that it costs less to install.

Mr. Oates is finding applications for this new type enclosure particularly in the dyeing, bleaching, and soaping areas.

Courtesy Square D Co.

Case 33 — Texas

SCAFFOLDS



DIFFERENT paint jobs require different types of scaffolds when working off the ground. Besides selecting the most useful, we have to look at it from a safety point of view, which is the most important factor.

Two scaffolds were constructed at the Roswell Plant for two different paint jobs. One of them is for the prime purpose of painting the exterior of No. 11 boiler stack. This was made in a half moon shape to fit around a small portion of the stack and is big enough for two men to easily and safely paint together. The dimensions are 18" wide by 1/3 the circumference of the stack. They are designed for a maximum weight of approximately 1,000 lb. The material consisted of ¾" pipe and angle iron with a ¾" plywood bottom fastened on with nuts and bolts to secure it. Three pulleys are used for hoisting (for balance) with a painter on each side and a ground man for the center pull.

The second scaffold was built for painting the building exterior and was constructed of ¾" pipe and angle iron. This was made in a rectangular shape 8' long by 24" wide, and designed for an approximate weight of 1,000 lb.

The outstanding feature is the adjustable wheels in front for easy movability up and down structures being painted. These wheels were bolted onto a ½" steel plate containing 3 holes for adjusting wheels to fit the surface.

Although we are not scaffold experts, we believe those we have constructed fit our particular needs. They were designed by the Plant Engineer and Maintenance Foreman and built by the Maintenance Crew.

By BOB McALLISTER
Plant Chemist, Roswell Plant
Southwestern Public Service Co.

Case 34 —

Job Analysis and Standardization

REDUCED costs along with reduced manufacturing cycles, in other words, increased productivity, were the main goals of this particular project.

At the start the parts of the internal assembly of our liquid load center transformers were made for a specific customer order. They were then accumulated and given to two-man operating teams, who did the assembly operations.

How to reduce this manufacturing cycle along with the costs? The various ratings of transformers were studied in detail as to what could be standardized among them Collating charts were made and determined effort was put forth in Design Engineering to use as many identical parts as possible across the lines of ratings.

At the same time, Manufacturing was studying how to put these parts into as many sub-assemblies (bench work) as possible, as well as eliminating the customer order manner of making parts. The parts which could not be standardized into identities because of transformer ratings were left as before.

Standardization among small parts allows these parts to be made in lot quantities rather than for a specific customer order. These stock parts assume the identity of a customer order when they are put together into major sub-assemblies. The major components which could not be standardized because of ratings were continued as before. Individual work stations were laid out, connected by an endless drag chain conveyor which moves the heavy assembly between work stations. The major components and sub-assemblies are pre-positioned at the individual stations for the operators.

The major elements of the assembly operation were broken down into: land coils and end sheet, assemble unit, connect unit, and inspect, each major element to a work station.

The next phase was specific training of the operators within these work stations and the final phase was the hanging of the conventional tools used, placing them on balancers hung from overhead track, allowing the operators to have all equipment required within arm's reach. This operation has been reduced to four hours at an annual savings of approximately $25,000.

By T. J. NARY, Manager
Manufacturing Engineering
General Electric Company
Rome, Georgia

Case 35 —Southern Paper Mill

Speed-Draw Instrumentation

IN EARLY 1960 Westinghouse installed a Digital Speed Draw Read-Out Instrument on a paper machine in a Southern mill.

Utilizing digital instrumentation which is a pulse counting technique, as opposed to analog devices which measure quantitatively, the machine operators are assured accurate indication of speed of any machine section, as well as indication of draw between any two sections of the machine.

This Speed Draw Read-Out Instrument is transistorized; it uses no tubes. All components are static and have the usual advantage of static units: long life, no moving parts, low maintenance and great reliability. It displays on a read-out panel, the speed of a machine section or the draw between two sections of the machine down to one-tenth of a foot per minute. Included with this instrument is a recalibration panel to adjust for 10 per cent roll diameter reductions due to grinding.

Except for the small pulse pick-up units located on the section in-drive shafts connected through two-wire shielded cable, the instrument with its display panel is completely self-contained in a cabinet approximately 20 inches wide by 19 inches high and 9 inches deep.

Digital Speed Draw Read-Out Instrument. This instrument indicates in actual feet per minute either the speed of a particular machine section or the draw between two sections of the machine. To get this information the dials at the bottom of the panel are set for the desired section or sections and within moments the correct figures appear on the read-out panel.

This instrument permits instantaneous visual paper machine speed and draw indications in absolute feet per minute. The information gained through this instrument monitoring of the machine speed can be recorded and utilized in the future for setting the machine for other runs of the same type paper production.

Case 36 —Virginia Office Building

Glass Tinting Product Solves Sun Glare Problem

EXTENSIVE use of aluminum and glass was featured in construction of Reynolds Metals Company's new multi-million dollar General Office Building in Richmond, Virginia — "an aluminum showcase in a Virginia garden setting."

Some 1,235,000 pounds of aluminum blended well with huge windows — more than four and one-half acres of glass — to make the building a classic example of contemporary architecture. But the large areas of glass brought a sun glare problem.

A new Du Pont plastic — called Sun-X Glass Tinting — was applied to more than 10,000 square feet of glass to solve the problem. This liquid plastic, which was flowed onto 10-by-14-foot glass panels, dried within an hour after application, leaving a smooth, transparent tint on the big windows. It was an economical and effective solution to the sun glare problem.

R. M. C. Glenn, manager of the building, said many additional advantages resulted from the glass tinting, including reduction of the heat load which brought substantial savings in air conditioning operating costs.

"The temperature in some rooms was lowered by as much as 25 degrees," Mr. Glenn said. "Sun-X was applied to all the glass panels on the first floor of our executive wing, and we found that all of our vice-presidents could leave their draperies open without eye or heat discomfort. It was also added to all windows in the cafeteria and lounge on the lower level facing the south."

Additional benefits attributed to the new Du Pont material were reduction of sun fade damage to draperies and furniture fabrics and improved insulation. The Sun-X tinted windows kept coolness inside the building during summer and warmth inside during winter.

Sun-X, by Du Pont, was introduced on the world market last year as a means of providing advantages of factory-tinted glass at considerably less cost. It is applied to existing windows of all types to reduce heat, fade, and glare. American Glass Tinting Corp., of Houston, Texas, is international distributor.

FOR MORE INFORMATION

On Equipment Mentioned in this Special Issue.

Write the Editors and mention the case Number.

Case 37 — North Carolina Utility

Long Life Promised for Wooden Pilings in Marine Locations

WOODEN PILINGS have a long history as supporting members in marine locations. Many marine engineers generally prefer wooden piling for a number of reasons, including (1) original cost, (2) light weight and ease of handling and (3) the natural resiliency of wood as contrasted to rigid steel and concrete.

Even when fully treated with the best preservatives available, the life of wooden piling is seriously limited when used in waters where marine boring organisms are active. The preservatives gradually leach into the water until their toxicity is reduced sufficiently to permit the destruction of the wood by the wood borers.

A Southesastern utilities company has found the effective life of treated piling to be less than ten years in the coastal regions of North Carolina.

With the total cost of replacing piling in mind, this company recently installed some new piling which is protected with a corrosion-resistant metallic sheath to provide a mechanical barrier to preservative leaching and, hence, any significant marine borer attack. It is estimated that complete protection will be provided for at least thirty years.

Basically, the new technique consists of sheathing only those portions of the piling which are to be exposed between the mud line and the low tide level. The material selected for the sheathing was an alloy of 90% copper and 10% nickel.

This alloy has been shown to have exceptional corrosion resistance when exposed in sea water moving at relatively low velocities, suffering a thickness loss of less than .001" per year. In addition this material is stiff enough in thin sheets to provide ease of handling.

To facilitate application and assure permanent attachment of the sheathing, Monel (International Nickel Co.) nickel-copper alloy nails were used to attach the sheathing to the piling. These nails have serrated shanks to provide a positive hold in the wood.

Three 40 foot long, 12 inch butt diameter pilings were used in this installation. Each had been given a full pressure treatment with a creosote-coal tar preservative to provide full protection against rot in those areas below the mud line and above the low water line where sheathing would not be applied.

The method of application of the sheathing is shown in Figure 1. The piling was laid across the barge, the areas to be sheathed marked and a sheet of 90/10 Cu-pro-Nickel alloy 40" x 120" x .020" thick placed around the pile. The sheathing was held tightly in position with a rope while all seams were nailed tight. The completed sheath is shown in Figure 2. The pile was then jetted in place until the top of the sheathing was a few inches above the low water line.

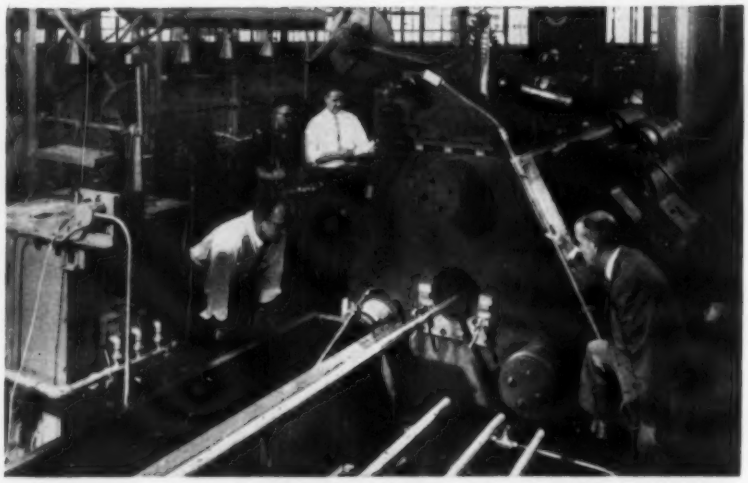
Initial perforation of the sheathing due to corrosion is not expected for at least 20 years. The preservative in the piling, which will have had no opportunity to leach out, should provide positive protection for another 15 years.

When considering the high cost of removing and replacing deteriorated piling from existing structures, particularly in inaccessible locations under piers and wharves, the extended life promised by sheathing should more than justify the additional cost at the time of the original installation.

By D. B. ANDERSON
Kure Beach (N. C.) Testing Station
International Nickel Co., Inc.

Case 38 — Alabama Metal Working Plant

Special Men and Special Equipment Needed for Special Metals Fabrication



HIGHLY flexible 700-ton extrusion press at Wolverine plant was designed to handle a variety of metals as well as a variety of base tube sizes and lengths.

THE WOLVERINE Tube Division of Calumet & Hecla, Inc., which has one of its major plants in Decatur, Alabama, is beginning production of tubes and rods of metals, such as zirconium, titanium, molybdenum, tantalum, columbium, vanadium and chromium. These special metals are used in aircraft, missile and rocket applications where high strength and light weight are required, and in chemical processing when outstanding corrosion resistance is demanded.

Such metals solve a lot of problems, but create many as well. They are very tricky to work with in forming desired shapes. Primarily this is because very little is known about their solid-state physical characteristics. Such knowledge is necesary before the metals can be worked on any sort of dependable production schedule.

Although Wolverine is now getting into commercial production of special metal fabrications for the first time, the company has been conducting research on the problems involved for a number of years. During this time they've learned a great deal about the pitfalls inherent in working these metals, and how to cope with them.

Many plants have got to the threshold of volume production of the standard shapes — often even to the point of cataloging them — but more often than not it has been found that what works one time will fail the next.

Wolverine has now reached the point in its research where it can bring actual experience into play and put a wide variety of the desired special metals shapes on a genuine production basis.

The company has found that the special metals have many problems in common. They generally have to be cladded with another metal to prevent gas contamination during extrusion. They also must frequently be vacuum annealed. Difficulties arise when vacuum annealing must take place at high temperatures. The furnace wall can collapse or materials can vaporize and plate out.

From a cost point of view, the two key problems are developing better lubricants for extrusion and drawing, and improving overall metal yield. The latter refers to the pounds of acceptable product obtained per pound of starting material. In many cases, minor changes in handling techniques or operational sequences can avoid substantial losses of costly material.

None of these problems or difficulties is insurmountable or even very serious. But it takes the right kind of effort in terms of approach, people, and facilities to overcome them.

Too often, fabricators try to do development work on the special metals with regular plant people and equipment. This means working materials on production facilities designed for other uses. It seldom works.

A properly equipped special metals facility is a necessity and should include a number of machines and facilities that differ appreciably from those used for more conventional production work.

It is also important to have the right people operating the equipment, Wolverine Tube has found. They must be of a much higher quality — of at least above-average educational achievement — than would be acceptable for a conventional mill facility. In a real sense they are technicians.

Not only are the production techniques inherently more complex and variations in operational procedures more critical than in the case of conventional materials, but the operators must exercise more judgment and be able to make more important decisions.

One of the most important qualities these workers must have is a positive desire and strong motivation to avoid scrap and loss of material. Unless waste is kept to a minimum, commercial production of shapes from these metals is not economically feasible.

There are many more problems left to be solved in fabricating these metals. It will not be easy for some time to come. But the growing need for the special quali-

ties of these metals, such as high strength at elevated temperatures, high corrosion resistance, high strength-to-weight ratios, and low neutron absorption cross section, will make it necessary for fabricators interested in the future to learn how.

Case 39 — Florida

Solenoid Valve Control

ONE OF THE largest phosphate mines in Florida operates two big washing plants. In each plant is a small steam generator operating at 15 psi to supply steam for heating chemical solutions.

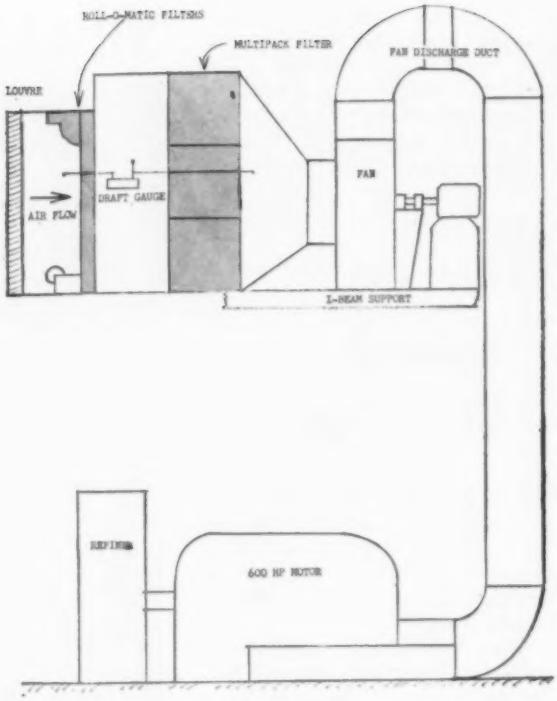
These generators receive their water supply from the general supply system in which the pressure varies from 10 to 80 pounds. Because of the great fluctuation in pressure, it was impossible to operate from line pressure and electric driven feed pumps were installed. But, at times of high pressure, the water would force its way through the pumps, water logging the generator and killing the steam supply.

To overcome this condition, someone installed diaphragm operated valves in the suction line and connected the diaphragm chamber into the discharge line. This resulted in a full stroke operation of the valve at each operation of the pump. As the valves were loaded with weighted levers, they were constantly beating themselves to pieces.

H. K. Wilson of St. Petersburg, Fla., was asked to recommend some means of improving the operation. Being state representative for the J. D. Gould Co., he recommended the installation of their Velvetrol solenoid valves. Valves with the same voltage as the pump motors were installed in parallel with the motors, with the result that when the pump starts, the valve opens, and when the pump stops, the valve closes. This system is operating without trouble or repairs. This suggests but one of the possible uses for this type of valve.

Case 40 — Southern Paper Mill

Clean Air for Fan



THE OWNERS of this Southern paper mill have a 600 hp duct ventilated motor driving a Sprout Waldron Refiner. Originally, the air supply to this motor was room air with no filtration. As is frequently the case, the air supply carries a heavy dirt and black liquor load and gradually sufficient fine dirt passed through the motor to cause plugging of the air passages in the windings. This buildup, plus an overloaded condition on the motor caused several winding failures.

The motor was rewound for a higher horsepower rating, and a solution to prevent recurrence of the dirt build-up was sought with the final selection of a Roll-O-Matic filter (self renewing media type) as the first stage of filtration to handle the excessive loading of larger dirt particles. This was followed by Multi-Pak Filters, with 50 FG media as the final filter to remove the "fines." The combination filter will handle heavy dirt loads, and yet give an efficiency of 90%+ by the National Bureau of Standards Discoloration Test Code on Atmospheric Dusts. This means it will remove particles as small as tobacco smoke from the air stream.

The installation was arranged as shown by the drawing. Outside air supply is through weather louvers; next, the Roll-O-Matic primary filter; then, the Multi-Pak as final stage of air cleaning. All are connected to the fan and motor by suitable duct work. This installation has now operated about 18 months with almost perfect results as revealed by examination of the motor windings.

This filter installation is much liked by the operating personnel because it takes care of itself for periods of ten to twelve months with only casual checking.

The system is provided with draft gages that indicate the differential across the two stages of filtration, providing visible and audible alert if a predetermined pressure is reached.

By DALLAS DEEM
American Air Filter Co.
Tulsa, Oklahoma

Case 41 —

Before and After Painting the Ceiling

THE DEFINITE possibility of brightening any factory by painting the ceiling white is proven by the photographs taken "before and after." Good lighting is essential for good production. New lighting fixtures are going to be added to this area that will intensify the lighting by five times, in the wiring and assembly departments of the St. Louis plant of Day-Brite Lighting, Inc.

Case 42 — Virginia

Corrosion Inhibitor

USE OF CORROSION inhibitor is proving an effective means of reducing damage and cleaning costs in many Southern industrial plants. The following brief statements of performance will serve to illustrate how CRC, manufactured by Washington-Imperial Co., is cutting expense in various types of service.

• Protection of surfaces of looms at shutdown time was a problem in a Virginia textile plant. Application of the inhibitor has eliminated rust and deterioration at shutdown. Excellent results have been reported on Jacquard pins and on heddles. The life of electrical components and machinery in the dye house has been increased so that they are saving dollars in repairs and downtime, for pennies in an effective surface protection.

• Concrete stains were slopped on the bases and fronts of machines after they had been relocated in a Virginia metal fabricating plant. Fearing that a permanent stain might be caused by the high corrosive activity of the concrete, the Chief Engineer ordered inhibitor used. After several months no stain has appeared.

• Storage of parts without rusting was necessary in a Maryland metalworking plant. Sometimes one or two weeks elasped between the completion of mating parts and corrosion often altered critical measurements. Cleaning did not always remove staining. With the introduction of inhibitor, parts can now be made up three and four months in advance without fear of damage by corrosion. The critical areas of die sets are also similarly protected in storage for more than a year.

• The working surfaces of equipment were continually being marred by hand and finger prints of employees in a District of Columbia metalworking plant. Each machine is now treated periodically with inhibitor which eliminates staining of equipment by human acids.

Case 43 — Easy Does It — Handling Castings in Molten Form

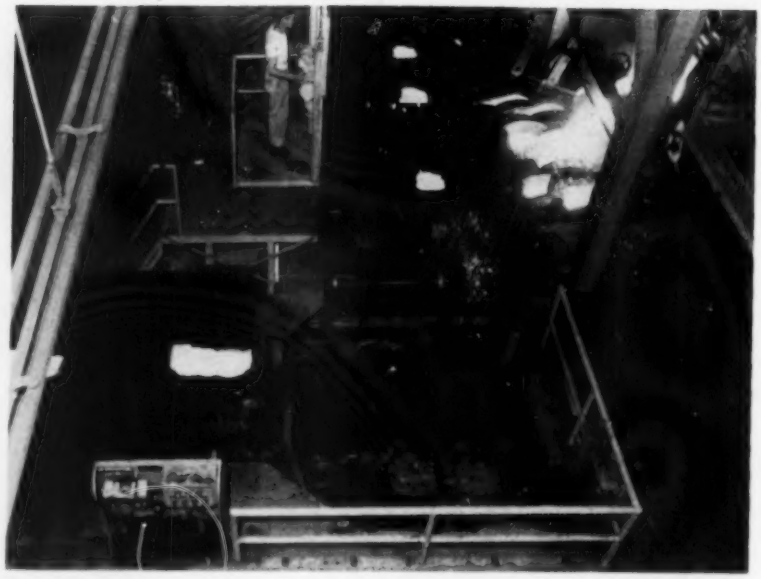
HIGH potential rate of output for a new major foundry in Louisville, Ky., was dependent upon an important feature of the conveyor design.

Full utilization of the vast modern foundry facilities made it necessary to convey large bathtub castings through a U-shaped system while the metal was in the molten state. Each tub mold (including molten metal, flask and delicate sand mold) would weigh 18,000 lb. To prevent crumbling, the conveyor ride would have to be exceedingly smooth. All steps on the casting floor had to be synchronized for fast continuous operation.

Logan conveyor engineers and foundry equipment specialists of the producer together worked out an automatic casting floor system. The production rate achieved was one bathtub casting every minute.

Specially designed heavy-duty live flanged wheel conveyors give the required speed and smoothness. Molds glide through the two required turns on automatic air powered turn-tables. Gaps between molds in the 256 foot system are eliminated by automatic indexing.

The U-shaped automatic wheel series runs from the make-up zone to "shake-out," where hardened castings are removed. Two chain conveyors take automatically removed flask parts quickly back to make-up for reuse.

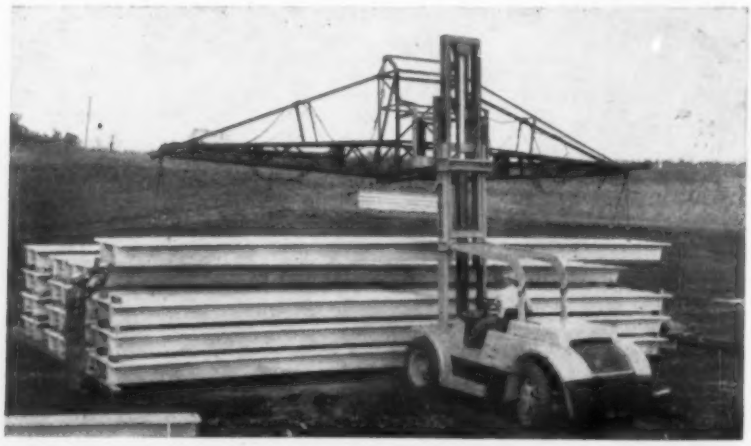


The turn-table (front center) has dispatched a mold to the cooling zone — now returns to pick up next mold from the pouring line. Ladles pour during turn-table's indexed one-minute cycle.

Case 44 — Kentucky Special Boom Solves Handling Problem

A LIFT TRUCK equipped with a specially constructed spanner boom performs an important duty in the manufacture of prestressed concrete slabs at the Ruby Lumber Company of Madisonville, Kentucky.

The firm uses a Hyster Challenger 200 lift truck of 20,000 pounds capacity to handle the slabs. A cantilever boom of the company's own manufacture, extending on both sides of the lift truck, is mounted on the forks.



Cables hook into eyes inserted near each end of the concrete slabs. The boom telescopes to accommodate slabs of different lengths. A precasting bed 350 feet long, four feet wide and 14 inches deep is used to form the slabs.

By using hot water heating to speed drying, the pan may be stripped the day after pouring. The truck lifts the slabs from the pan, setting them aside one by one until the entire pan has been stripped. After the pan is stripped, the lift truck carries the slabs to the stacking yard for storage (see photo).

Case 45 —

More Certain Overload Protection

A LARGE SOUTHERN manufacturer of orginial equipment for the textile industry was having considerable trouble with single phase motor burnouts on a particular application.

This manufacturer was aware that in many cases the motor starter overload protectors should have cleared the circuit before the motor was damaged. He, therefore, set up in his laboratory a testing device to check the accuracy of the overload devices in starters supplied by many of the large control manufacturers.

He now supplies only starters with melting alloy type overloads on these applications, as the result of his test. The Square D overload consistently trips with unerring accuracy at the correct current level affording protection not previously obtained.

Furnished by Square D Co.

Case 46 — Maryland

Time Saved in Bag Filling

A LARGE PIGMENT manufacturing corporation in Maryland experienced difficulty in starting valve type bags over the spout of the bag filling machines.

This bottleneck was eliminated by mounting a pointed cone of hardwood on each machine.

With this improvement the operator can open the bag valve by slipping it over the cone first. When the bag is withdrawn from the cone, the valve is open and properly shaped to go over the spout of the bag packer. The bag packers being used are Model C. P. Auger-Matic, manufactured by the C. D. Cuddington Manufacturing Company.

By H. J. SCHULTHEIS, Asst. Supt. Mineral Pigments Corporation

Case 47 — Baltimore

Airfoil-Bladed Fans for Cyclone Boiler

A PAIR of airfoil-bladed forced draft fans featuring one-piece forged design in critical wheel components was recently shipped by American-Standard Industrial Division for use in a cyclone boiler application at Baltimore Gas & Electric, C. P. Crane Plant, Unit No. 1, located in Baltimore.

The fans feature wheel hub and hubplate made as a one-piece forging to insure adequate strength for this high tip speed wheel and to give smooth air flow and maximum area through the wheel. Rims also are one-piece forgings machined to tapered thickness for uniform stresses throughout the section. Hubplate and rims are machined all over.

Balancing is accomplished by grinding material off as required. This is a departure from conventional practice wherein weights are welded to the wheel to balance it.

The fans have 75-in. diameter wheels. They are double-inlet, double-width design with inlet vanes for volume control. Capacity of each fan is 217,000 cfm at 100 F, 70.0-in. static pressure and 1780 rpm. Peripheral velocity is 35,000 fpm and bhp is 2620.0. The wheel and shaft are shipped as a single assembly.

Case 48 — Virginia

Annunciator Reduces Lost Time

A VISUAL and audible annunciator system can be a valuable tool for increasing production through the reduction of lost time.

In any continuous process type operation, power generation and otherwise, various levels, pressures, temperatures, and rates of flow, must be maintained within certain limits.

Instant alerting of operators to any set deviation in these vital conditions affords maximum time for corrective action that might prevent a shutdown. For instance, the average deaerating type feedwater heater has a limited storage capacity — frequently measured in minutes. Failure of the supply pump to this heater and instant warning by the annunciator system notifies the operator of the nature and location of the trouble, and usually gives sufficient time to start a spare pump.

Malfunction in remotely located equipment can be detected and notice given at a central point. In some instances perhaps, corrective action can be taken at this control point by remote control.

A vibration acceleration sensitive device now available is said to give warning of impending trouble, such as bearing failure.

Most conditions that can be measured can be monitored to give notice of change. Many plants have strung together makeshift alarm systems to achieve this. These are usually unreliable. There are available a number of package annunciator systems that can be used with existing alarm contacts. Equipped with plug-in type relays and components, they can be extended as conditions warrant. One shutdown prevented will usually pay for the cost of the installation.

By F. M. BRAGG
Albemarle Paper Co.
Richmond, Va.

Air Conditioning for Specific Area Needs

Case 49 — Kentucky

By JOHN VONDERHEIDE
Manager — Plant Engineering
General Electric Company
Appliance Park, Louisville, Ky.

WHILE GENERAL Electric's mammoth industrial community, located in Louisville and known as Appliance Park, has been widely publicized over the past five years or so, it will probably always remain an important proving ground for reasons of facilities design innovations and progress—the problem of air conditioning is certainly no exception.

With more than 5,000 tons of installed conditioning capacity in service and just about all types of systems being used, the trend and experience with the theme of "installing air conditioning according to the known area usage" has turned up some very interesting facts.

Earlier office buildings and factory area requiring temperature control were equipped with central, section, or zone type systems. But the last two large product department buildings constructed were equipped entirely with "package" air conditioning units. Size and layout pattern for the package units were based strictly on occupancy rather than what would be required for complete coverage of the building using conventional design criteria.

For a long period, factory offices and similar areas were considered beyond the economic reach of air conditioning justification, and ventilation systems were used. Later experience showed that the small size package air conditioning unit could do a better job for less overall cost.

When considering any air conditioning need, Appliance Park facilities design engineers recommend application of the following "Rule of Thumb" as being entirely adequate to achieve excellent results:

1. Small office, studio, and residence type areas — 300 sq ft per ton plus Btu addition to compensate for any necessary duct system loss.

2. Office buildings — 250 sq ft per ton plus Btu addition for any special exhaust or air intake systems. These figures are based on 3 watts per square foot for lights and office machines, one person to 80 square feet, and approximately 1½ fresh air changes per hour.

3. Industrial plant buildings — 200 square feet per ton plus Btu addition for all power consumption above 5 watts per square foot, and Btu addition for handling tempered air make-up to balance against process exhaust requirements.

4. Laboratories or special-use areas — 200 square feet per ton plus Btu requirement to compensate for process equipment involved. Other examples would be

cafeterias and auditorium type areas which must include the allowance of ten people per ton as a load design condition.

In applying the above suggested design criteria, Appliance Park has found that while the initial cost of central type air conditioning systems ranged from $800 to $1,000 per ton, the cost of package type installations was between $500 and $800 per ton. Annual maintenance cost appears to be about $5 per ton lower than central systems and the actual operating cost was $3 per ton lower for packaged systems during the period reviewed.

Initial design capacity requirements were lower, for example, approximately 400 tons installed in a building, which would require over 500 tons if the conventional central system type design was used, provided satisfactory comfort conditioning and offered extreme flexibility improvement.

Almost all factory offices are now equipped with small package conditioning units (room air conditioner type) at a cost of approximately $600 per office unit instead of the previously utilized ventilation system cost in the vicinity of $750. Obviously, the occupants are much more satisfied with the resulting conditions.

Appliance Park plant facilities engineers make it quite clear they recognize that all types of air conditioning systems still have their rightful place in this important field. But they certainly do believe that the design theme explained here might well offer an opportunity for easier economic justification and really contribute toward long-range profit.

WRITE THE EDITOR

For additional Information on any equipment mentioned in the 49 case studies presented on the preceding pages.

Francis C. Smith, Editor
Southern Power & Industry
806 Peachtree St., N. E.
Atlanta 8, Georgia

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8—Ceramic Coatings — Chempro sprayed ceramic coatings to resist abrasion, erosion and corrosion described in Bulletin CP-28. Ideal for shaft, shaft sleeves, impellers, valves, cams. — CHEMICAL & POWER PRODUCTS, INC.

10—Floor Maintenance — Literature describes how the complete line of Lincoln-Wilshire automatic equipment for scrubbing, sweeping and polishing floors will cut plant maintenance costs. — AMERICAN-LINCOLN CORPORATION.

12—Lubricator Vacuum Type Pumping Unit—If your plant is experiencing difficulty with visibility and excessive maintenance on lubricator sight glasses, the 82 vacuum pumping unit will offer lower cost. Form 1263 gives principle of operation and advantages.—MANZEL.

15—Stress Relieving — Data sheets describe medium frequency (1200 to 12,000 cycles) induction heating equipment for stress relieving of weldments and shrink fitting. Mobile power converters and special cable. — BROWN BOVERI.

17—Mechanical Packings — 32 page Cat. PC-103 describes a variety of packings and gaskets, including self-lubricating, sheet and molded packings. Includes application charts and price information. — GREENE, TWEED & CO.

18—Maintenance Ideas — 4-page folder highlights 90 ways Kano Kroil and other products can help the man-in-the-plant.—KANO LABORATORIES.

24—Roof Maintenance — 4 page catalog 5D describes Dri-N-Tite products for patching, priming and coating composition, corrugated or sheet metal, slag, gravel, concrete and felt roofs. — A. C. HORN COMPANIES.

27—Corrosion Control Systems — Five-step procedure outlined in Brochure 9111 for primary protection and preventive maintenance of all metal surfaces subject to acids, alkalis, solvents, fumes and gases.—TRUSCON LABORATORIES.

37—Maintenance Gun — Brochure describes the Von Arx Air Gun —lightweight tool for tough cleaning, de-scaling and de-rusting jobs. Air operated reciprocating needles adjust to contours automatically. Three sizes. Comes in handy kit with accessories.—MARINDUS COMPANY.

38—Heavy-Duty Wrench Set — Bulletin 8141-C details the Loxocket 521-EHD-B. Metal case containing 17 sockets from 1 7/16" to 3⅛", ratchet, sliding bar and two extensions — 8" and 16" — ready to go on any assignment.—SNAP-ON TOOLS CORPORATION.

53—Steam Line Treatment — Folder describes alkaline IPCO S-L-T. Used in boiler water, it will volatilize and travel with steam to return lines. Prevents costly repairs and provides insurance against replacing pipe and fittings. — IPCO LABORATORIES, INC.

64—Anti-Corrosive Paints — Bulletin, "The Application of Subox and Subalox Paints," gives the story of a complete paint system for weather, moisture and alkali protection, with details as to application.—SUBOX, INC.

66—Tube Expanding — Bulletin 55 on torque control describes automa-

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tic air driven tube expander drive. Control assures uniformity of tube expanding. — THOMAS C. WILSON, INC.

78—Control Heat & Glare — New folder tells how Sun-X Glass Tinting (transparent alkyd-based liquid plastic by DuPont) is applied directly to existing glass by flow process without spray or splatter. Bonds tightly. Wash in usual manner. — AMERICAN GLASS TINTING CORP.

95—Plant Lubrication — The Lubriplate Service Handbook — Gives valuable information on the subject of lubrication in all its forms, intended to be of everyday use to plant superintendents, managers, maintenance engineers and those in charge of plant production and maintenance.—LUBRIPLATE DIVISION, FISKE BROTHERS REFINING CO.

96—Tube Cleaners — Mechanical units for boilers, condensers, evaporators and pipes described in Catalog 77A. Over 100 pages of air motors, cutting heads, drills, etc. — THOMAS C. WILSON, INC.

FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

122—Industrial Fans—Bulletin 702 covers Type XL fans for air and material handling. Volumes to 130,000 cfm pressures to 18" SP. Catalog 855 describes Pressure Fans. Volumes to 12,000 cfm, 10" to 50" SP. — CLARAGE FAN CO.

128—How to Solve Pumping Problems — 36-page booklet gives general explanation of rotary gear pumps and factors involved in pumping; three sample problems; technical data — graphs and tables. — ROPER HYDRAULICS, INC.

160—Boiler Feed Pumps — 12 page Bulletin 122 describes and illustrates the type BFI high pressure pumps. Design features, service ratings and engineering data included —PACIFIC PUMPS, INC.

165—After Cooler — Bulletin 130 shows how the Aero unit removes moisture from compressed air or gases; cools water for jackets and intercoolers; cools air or gases in both power and process systems; and protects air tools and pneumatic systems from water damage.—NIAGARA BLOWER COMPANY.

168—Centrifugal Pumps — Bulletin 720.4 describes line of single stage side suction centrifugal pumps with open impeller for wide variety of industrial uses. 13 sizes, 1¼" to 8", capacities to 3000 gpm and heads to 180', with the addition of two large sizes: 6 x 8 - 13 and 8 x 10 - 11. —GOULDS PUMPS, INC.

INSTRUMENTS—METERS CONTROLS—REGULATORS

205—Draft Gages — Bulletins describe inclined, vertical tube, air filter gages, straight line and dial pointer type, minified draft and receiver type gages, velocity gages and pitot tubes, gas analyzers and steam calorimeters. — ELLISON DRAFT GAGE CO.

222—Pressure Regulators — Catalog No. 77 illustrates and describes application, operation and specifications for a complete line of reducing, back-pressure and pump-pressure regulators.—MASON-NEILAN.

223—Combustion Control — Bulletin 1023, 24 pages—Contains installation photos and diagrammatics of Bailey air operated combustion control for oil and gas fired boilers; two pages of chart records and six page list of typical installations. — BAILEY METER COMPANY.

235—Liquid Level Gauges — Bulletin 463A describes automatic remote reading systems for nearly any liquid. Features include easy to read dial indication. — LIQUIDOMETER CORP.

267—Remote Liquid Level Indicators —Bulletin RI-1825 describes indicators for pressures up to 3000 psi —advantages, operation and specific installations. — YARNALL-WARING COMPANY.

281—Diaphragm Control Valves for accurate control of pressure-temperature, liquid level, etc., described in Catalog J-170. Designed specifically for instrumented process systems requiring linear flow characteristics and tight shut-off.—OPW-JORDAN.

PLANT CONSTRUCTION—WELDING EQUIPMENT—SPECIALTIES

322—Heat Transfer Cements — Engineering Data Book 502 includes calculations, estimating and installation procedures on properties and uses of Thermon heat transfer cements. Contains complete list of Southern engineering representatives. — THERMON MANUFACTURING COMPANY.

323—Mercury Vapor Fixture — Industrial color corrected units described in Bulletin 401. "Stabilux Socket" secures bulb end of lamp, eliminating lamp rupture and breakage from vibration. — WIDE-LITE CORP.

324—Painting New Plants — "Plan Painting of New Plants to Reduce Costs" describes how company's lead-suboxide paints can save 1 or 2 coats of paint on new plants. Eventual repainting costs are cut as well since these paints form a dense, metallic lead film which can be recoated without expensive scraping, sanding or repriming.—SUBOX INC.

330—Elevated Water Storage — 4-color catalog describes the Aquatore — a new elevated water tank design with capacities from 300,000 to 3,000,000 gallons. Many design advantages including no struts or tie-rods. — GRAVER TANK & MFG. CO.

342—Power Roof Ventilators — Bulletin 550 describes V-belt driven centrifugal type power roof ventilators. Pressures to 2" SP; capacities from 1500 to 26,500 cfm.—CLARAGE FAN CO.

363—Magnetic Separators — Catalog 910 covers wet concentration and magnetic recovery. Various types and sizes shown as well as typical installations and machines. — JEFFREY MFG. CO.

370—Industrial Fence — You can eliminate pilferage, control traffic, and improve plant appearance most economically with Anchor Chain Link Fences. Catalog gives case studies from other plants in South-Southwest. — ANCHOR FENCE.

386—Rigid Frame Buildings—8 page bulletin "Dixisteel Rigid Frame Buildings" — low cost, flexibility of design, durability, and minimum maintenance; also triangular or bowstring truss all-steel roof systems; fabricated for rapid erection. — ATLANTIC STEEL COMPANY.

390—Tank Insulation—An uninsulated tank is like a giant radiator heating the outdoors—and that costs money. 8-page Ultralite Tank Brochure tells you how you can save over 90% of this heat loss with glass fiber blankets. Can pay for itself in six months to a year.—GUSTIN-BACON.

PIPING—VALVES—FITTINGS STEAM SPECIALTIES—TRAPS

401—Steam Traps — Bulletin 775 gives price, dimension and capacity data on Open Float and Thermostatic Steam Traps for trouble-free heating service.—ARMSTRONG MACHINE WORKS.

402—Forged Steel Valves—General Purpose Valves, Supplement No. 1 to Catalog F-9, covers gate, globe and angle valves, ½" through 2" sizes, for 150-800 pounds service. Featuring 13% chrome stainless steel trim with hard facings. — HENRY VOGT MACHINE CO.

403—Valve Operators—Folder shows how re-designed sprocket rim makes any valve readily accessible from the floor. Simplifies pipe layouts, prevents accidents, fits all valve wheels. — BABBITT STEAM SPECIALTY CO.

405—Temperature Problems—4 page folder "Service for Efficient Thermal Conservation" covers insulation solutions for high and intermediate temperatures, heating and air conditioning-low pressure steam, and ice water and frigid temperatures. — MUNDET CORK CORPORATION.

406—Blow-Off Valves — Unit-tandem valves for boiler pressures up to 665 psi described in Bulletin B-435. Tells how to specify and how to order. — YARNALL-WARING COMPANY.

412—Power Piping — 8 page brochure describes latest computer methods of analyzing power piping designs. — THE M. W. KELLOGG CO.

Bulletins (Cont.)

420—Valves — 24 page Catalog illustrates and describes bronze, iron, steel and corrosion-resistant valves for controlling the flow of water, oil, gas, steam and corrosive fluids. — THE WM. POWELL CO.

421—Air and Gas Traps — 8 page Bulletin No. 289 describes complete line of ball float traps for draining water from air, gas or steam lines or draining a light liquid from a gas under pressure (for pressures to 900 lb). Includes: installation, selection and ordering information.—ARMSTRONG MACHINE WORKS.

422—Welded Steel Pipe — 40 page catalog describes applications, advantages, standard specifications, production limits, linings and coatings, fittings, joints of welded steel pipe. Data tables, drawings, and illustrations included. — ARMCO DRAINAGE & METAL PRODUCTS, INC.

452—Pipe and Tubes — 42 page Bulletin 26 gives types of steel tubes, tensile, creep and rupture properties, welding and forming data, applications and other valuable information. — National Tube Div., UNITED STATES STEEL CORP.

465—Water Hammer — Cause, effect and control covered in Bulletin 851. — THE WILLIAMS GAUGE CO., INC.

BOILERS—STOKERS TURBINES—BURNERS

501—Packaged Steam Generators — DK units described in bulletin: 24 sizes for gas, oil or combination firing in capacities up to 60,000 lb/hr, with design pressures up to 600 psi. Special package boilers up to 100,000 lb/hr and field erected units up to 200,000 lb/hr for all fuels and all types of firing are featured. — E. KEELER COMPANY.

505—Refractories — Paco High Heat Duty and Super Duty Plastic Refractories. Fire brick, high temperature cement, castables. Installation and engineering service. Free estimates and inspection. — NORTH STATE PYROPHYLLITE CO.

526—2-Pass Automatic Boilers — Bulletin tells how Continental packaged boiler design cuts down on inspection and maintenance costs and keeps down time to a minimum. — BOILER ENGINEERING & SUPPLY CO.

509—Free Coal Counseling — General information on how Coal Bureau engineers will advise on selection, transportation and utilization of the right coal for your purpose. — NORFOLK AND WESTERN RAILWAY.

510—Vibra-Grate Stoker — Water-cooled vibrating grate stoker in sizes from 25,000 to 150,000 lb of steam per hour; no dust collector required and assures freedom from smoke, even at low ratings; easily adapted for burning gas or oil in combination with coal, or singly; requires minimum maintenance. — AMERICAN ENGINEERING CO.

521—Gas Tempering — How you can burn the most economical fuel available (coal, oil or gas) described in Bul. G-96. Cuts overall plant costs since smaller size unit requires smaller building per kw.—THE BABCOCK & WILCOX CO.

522—Deaerator — Bulletin 28B8853 describes tray type deaerator for effective removal of corrosive gases from boiler feed water. Includes cycle of operation, 6 typical storage arrangements, and table of standard tray deaerator data.—ALLIS-CHALMERS MFG. CO.

532—Economical Steam — Forced draft, pressurized gas or oil fired units described in SB-59 catalog. Two-drum water tube units include steam trim, draft equipment, burner and combustion safety controls. — ERIE CITY IRON WORKS.

See Pages 87 & 88

535—Unit Steam Boilers — Catalog AD-100 — Gives complete information on oil and gas fired "Self Contained" boilers, 15 to 500 hp, 15 to 250 psi for processing and for heating. Gives features, applications, efficiencies, capacities and dimensions. — CLEAVER-BROOKS CO.

542—Underfeed Stoker — Illustrated Cat. 401 gives complete data on double retort underfeed stoker built for heavy duty service in intermediate size range for boilers of 20,000 lb to 34,000 lb of steam/hr capacity. — DETROIT STOKER CO.

547—Gas and/or Oil Burners — Bulletin B1 describes large or small, single or dual fuel, packaged or field assembled, atmospheric or forced draft burners; electronic of all types; competent sales and service.—WEBSTER ENGINEERING CO.

555—Package Air Preheater — 14 page booklet tells how you can install this package unit at fraction of expense required for conventional heat recovery equipment. Fast and easy installation offering long term fuel savings. — THE AIR PREHEATER CORP.

557—Coal — Current brochure on "Prescription Coals." — A. T. MASSEY COAL CO., INC.

561—Ash Removal — Bulletins S-57 and S-57A show how costs can be reduced with pneumatic and hydraulic ash conveyors. High operating efficiency based on tons of ash handled per pound of steam used. — NATIONAL CONVEYORS CO., INC.

565—Self-Contained Boilers—8 page brochure AD-162 describes company's line of Model CB boilers. Highlights design features, fuel flexibility, four-pass, forced draft design, unified electric and steam preheater, quiet vibrationless impeller, and hinged doors with built-in refractory.—CLEAVER-BROOKS CO.

574—Packaged Generator — Bulletin 582 describes Vapormatic Coil-N-Shell Steam Generator for service requirements of 5 to 150 psig. Gives operation features and specification data. Available with gas, oil, and combination gas/oil fuel systems. — TEXSTEAM CORP.

590—Packaged Rotary Burner—Fully automatic Roto-Pack forced draft units described in Bulletin; 6 sizes, 7 types to fit all automatically fired boilers or furnaces. Burn all grades of fuel oils, gaseous fuels or combination of both. — TODD SHIPYARDS CORPORATION.

591—Steam Generators — 18 sizes, from 20 to 600 bhp, for pressures to 250 psi, also for hot water. Complete details in Catalog 811F. — SUPERIOR COMBUSTION INDUSTRIES, INC.

ENGINES—DRIVES POWER TRANSMISSION MATERIAL HANDLING

602—Pneumatic Ash Conveyors — Bulletin S57-A describes pneumatic ash conveyors for rugged, wear-resistant pipe and fittings that provide lower maintenance cost per ton of ash covered. — NATIONAL CONVEYORS CO. INC.

606—Retaining Ring Kits — 400 Truarc cadmium plated rings — 84 sizes in one economy kit. Sizes from ¼ to 2½ in. in three most used series of internal, external and universal crescent ring designs — $34.50 per kit. — DIXIE BEARINGS, INC.

607—Crane Systems — Booklet 2008, profusely illustrated, shows how Tramrail transfer cranes can systematize handling; engineering and application data. — CLEVELAND TRAMRAIL DIV.

610—Flexible Couplings — Catalog 60 describes couplings for maintenance-free power transmission — no lubrication, no maintenance and no wearing parts. Recommended basic coupling arrangements and load classifications are featured.—THOMAS FLEXIBLE COUPLING COMPANY.

620—Shaft Couplings — Bulletin 98 describes various applications of full-floating shaft couplings. Used to connect shafts that are spaced far apart. — THOMAS FLEXIBLE COUPLING CO.

632—Gearmotors & Package Drives —8 page booklet DB-3650 illustrates horizontal, vertical, right an-

gle, open, enclosed, explosion-proof, a-c and d-c units with respective reduction ratios and output speeds. Speed range from 7.5 to 780 rpm. — WESTINGHOUSE ELECTRIC CORP.

641—Belt Conveyors — 88 page Cat. ID-591 shows principal belt conveyor products, including heavy duty and standard roller bearing and precision ball bearing idlers. Comprehensive Engineering Data section contains simplified and condensed information for proper selection. — CONTINENTAL CONVEYOR & EQUIPMENT CO.

651—Bearing Aluminum Bars—Aluminum bearings can replace bearings of other metals which cost twice as much. No sacrifice in performance or life. Catalog 46 covers composition, machining and use. — THE BUNTING BRASS AND BRONZE COMPANY.

WATER TREATMENT—HEATING & AIR CONDITIONING—DUST & FUME CONTROL—REFRIGERATION

704—Water Conditioning—Brochure describes company's engineering services — zeolite water softeners, filters and purifiers, aerators and degasitors and process and boiler water conditioning. Rebuilding and Modernizing service — SOUTHERN WATER CONDITIONING, INC.

705—Test Your Tower—Bulletin offers simple, proven method by which you can determine how closely your actual tower performance measures up to specified performance. Particularly applicable to operations geared to temperature of process cooling water. — THE MARLEY COMPANY.

711—Refrigeration Condensers—Bulletin RC-2 shows how Vogt condensers step up rate of heat transfer and step down head pressures. Closed type for clean waters; film type where water is hard and forms scale. Units save power and refrigeration cost. — HENRY VOGT MACHINE COMPANY.

712—Ion Exchange — Bulletins discuss Two-Bed De-Ionizers and Mixed-Bed De-Ionizers, with photos to illustrate plant applications and diagrams to show operation. — ILLINOIS WATER TREATMENT COMPANY.

713—Electric Precipitators—26 page Bulletin 104 shows how units meet five engineering requirements —Positive control of gas flow; high, uniform electrode emission; effective continuous cycle rapping; and safe, trouble-free high voltage equipment. Gives 9 time-tested steps to a successful installation.—BUELL ENGINEERING COMPANY, INC.

716—Dust Collection — Whether nuisance elimination or process material recovery, check on Whirlex Dust Collector Units. Engineering data available. — THE FLY ASH ARRESTOR CORP.

730—Hydrazine Bulletin BW 8, 10 pages — Discusses chemical reduction of oxygen in boiler feedwater with Deoxy-Sol, a 35% aqueous solution of hydrazine. Gives flow diagram; covers handling and storage; includes bibliography. —FAIRMOUNT CHEMICAL CO., INC.

751—Chemical Service — Water-conditioning products, equipment and services highlighted in literature — boiler feedwater treatment, cooling water treatment, corrosion inhibitors, fuel oil additives, coagulants, cation resin cleaners, etc. — Chemical Service Dept., THE PERMUTIT COMPANY.

764—Cooling Equipment — Bulletin 80-D describes company's complete line of commercial and industrial equipment — operating principles, design features.—FRICK CO.

771—Water Treatment — 4 page brochure points out company's 8-point water treatment coverage for elimination of scale, sludge, corrosion and impure steam. — IPCO LABORATORIES, INC.

ELECTRICAL

802—Low-Peak Fuses — New Fuses that safely interrupt fault currents up to 200,000 amp described in Bulletin LPS. Protect mains, feeders, branch circuits, switches, etc. Limit fault current to very low values. Hold 500% load for minimum of ten seconds. Available in N.E.C. sizes from 15 to 600 amp in both 250 and 600 volt ranges.—BUSSMANN MFG. DIV.

807—Motor Bearings — Catalog 258 gives complete listing of cast bronze motor bearings for all makes and sizes. — THE BUNTING BRASS AND BRONZE COMPANY.

855—Wiring Analyzer — 4 page bulletin describes Model 301 Adequate Wiring Analyzer which quickly, simply and easily tests wiring without confusing calculators or slide rules.—SPRAGUE ELECTRIC COMPANY.

Late Bulletins

K-1—Gate Valves—Form AD 2426/-30M/4-60, 6 pages, introduces a new line of 150 lb and 300 lb steel flexible wedge disc gate valves featuring a flexible wedge disc, marketed under the trade name "Flex Gate." Design and construction data and dimension tables are included. —CRANE CO., Industrial Products Group, 4100 S. Kedzie Ave., Chicago 32, Ill.

K-2—Industrial Insulation — Form 6451, 4 pages, lists all types of Carey industrial insulations and insulating cements, including Careytemp, which offers heat resistance up to 1600 F and is resistant to moisture, acid and corrosion. Tabular product selection guide indicates applications for various requirements. — PHILIP CAREY MFG. COMPANY, 320 S. Wayne Ave., Cincinnati 15, Ohio.

K-3—Electrical Flow Meters — Publication No. 59.5, 28 pages, decribes remote reading electrical flow meters for liquids and gases at line pressures to 5000 psi. Gives engineering features, flow charts, and typical arrangements. — REPUBLIC FLOW METERS COMPANY, 2240 Diversey Parkway, Chicago 47, Ill.

K-4—Register Burners — Bulletin RB-60 covers complete line of register burners, available for a wide variety of uses. Illustrates many applications where the gas and oil burners are used. — COEN COMPANY, INC., 40 Boardman Place, San Francisco, Calif.

K-5—Water Reducing Valves — Bulletin 553-A, 4 pages, "Eliminate Water Waste with Controlled Pressure," points out ways that proper valve selection and application can reduce hidden costs in use of water in industry. Describes valve operation and proper sizing procedures. — LESLIE CO., 230 Delafield Ave., Lyndhurst, N. J.

K-6—Hose & Cable Reels — New catalog describes automatic reels for hose and cable, including styles and types for single and dual hose and cable application, mounted on floor, wall or ceiling, or on mobile installation. — UNITED SPECIALTIES, INC., P. O. Box 698, El Dorado, Ark.

K-7—Pressure & Temperature Recorders—Catalog 800, 8 pages, pictures spiral bourdon tube and bellows type pressure elements, and temperature elements actuated by mercury, vapor pressure, gas pressure, and organic liquid. Tables list thermal characteristics. — U. S. GAUGE DIVISION of American Machine and Metals, Inc., Sellersville, Pa.

K-8—Variable Capacity Pump—Bulletin No. 600, 8 pages, introduces new line called Vari-Flow, which makes it possible to dial any desired flow rate from zero to full capacity without changing pump speed. Explains principle of operation and illustrates basic models. — BLACKMER PUMP COMPANY, Grand Rapids 9, Mich.

K-9—Air Compressor—Bulletin 175, 20 pages, presents the Isotemp packaged centrifugal air compressor line for air separation plants and industrial use. Engineering data permits approximating horsepower requirements for various applications. Illustrates design features.—CLARK BROS. CO., Olean, N. Y.

K-10—Pipe Insulation — Bulletin J-660, 4 pages, describes thermal and physical characteristics of Mono-Kover, a one-piece pipe insulation for service from below zero to 350 F, and explains easy application of the mineral fiber material. Specifications are provided. — BALDWIN-EHRET-HILL, INC., 500 Breunig Ave., Trenton 2, N. J.

(*Continued on page* 92)

Bulletins (Cont.)

K-11—Instruments & Controls — Catalog 4-60, 14 pages, illustrates wide variety of industrial instruments and controls, including selection of liquid and granular solid level controls — gamma radiation, capacitance, float actuated, electronic, pneumatic and mechanical. — INSTRUMENTS, INC., P. O. Box 556, Tulsa, Okla.

K-12—A-C Motors — Catalog, 56 pages, includes complete pricing and dimensional data on a-c multi-shielded motors from ¼ to 200 hp, including information for various modifications, such as specialized mountings and enclosures, as well as the new Sterlicone multi-shielded drip-proof motors. — STERLING ELECTRIC MOTORS, INC., 5401 Telegraph Road, Los Angeles 22, Calif.

K-13—Vibratory Handling — Condensed Catalog No. 605, 68 pages, presents descriptions, data and specifications on all Syntron products, including vibratory materials handling equipment, mechanical shaft seals, paper joggers, and portable power tools. — SYNTRON COMPANY, 118 Lexington Ave., Homer City, Pa.

K-14—Dust Separators — Bulletin D-20, 8 pages, details information on Dual-Clone dust separators, giving performance data, installation photos, selection and dimension charts. Explains basic principles of dust separation by cyclonic action plus patented internal "skimmers." —THE DAY COMPANY, 810 Third Ave., N. E., Minneapolis 13, Minn.

K-15—Heat Exchangers — Bulletin 110 illustrates and describes a newly developed low-cost, double pipe heat exchanger with amplified assembly and disassembly and maintenance features. Explains design of the 3" low pressure heat exchanger, and lists materials available. — BROWN FINTUBE COMPANY, 300 Huron St., Elyria, Ohio.

K-16—Conveyor Drives — Bulletin 7106 presents data on screw conveyor drives available for applications in range from ½ to 30 hp, in four ratios, designed to bolt to standard trough ends. Describes construction features and accessories, with selection and dimension information. —THE FALK CORPORATION, Dept. 255, Box 492, Milwaukee 1, Wisc.

K-17—Explosion-Proof Pumps—Bulletin No. 728-1, 4 pages, gives specifications, performance curves and dimensions for canned pumps featuring UL approved explosion-proof construction for handling flammable liquids in hazardous locations. —GOULDS PUMPS, INC., 215 Black Brook Rd., Seneca Falls, N. Y.

K-18—Cyclone Strainer — Bulletin S-1KN, 8 pages, describes new cyclone strainer designed with completely automatic cleaning and backwashing. Graphs, specifications, and selection data are included. — HENRY PRATT COMPANY, 319 West Van Buren St., Chicago 7, Ill.

K-19—Bus Duct — Bulletin 30-663, 12 pages, contains application data for high-frequency bust duct. Descriptions, drawings, dimensions, and engineering data give information needed to lay out, specify and install. — WESTINGHOUSE ELECTRIC CORPORATION, P. O. Box 2099, Pittsburgh 30, Pa.

K-20 — Condensate Scavenging — Bulletin WC-128, 12 pages, "High Rate Condensate Scavenging for High-Pressure Central Stations," considers advantages of the process and equipment for scavenging. Describes new Graver automatic tape analyzer. — GRAVER WATER CONDITIONING CO., 216 West 14th St., New York 11, N. Y.

K-21—Heating Specialties — 1960 Condensed Catalog, 12 pages, contains technical details, dimensions, and capacity data on most widely used devices in Sarco line of steam traps, temperature regulators, and heating specialties. — SARCO CO., INC., 635 Madison Ave., New York 22, N. Y.

K-22—Pipe Connections — 1960 Catalog — Contains all new types and ratings of Grayloc clamps, collar-type unions, flanges, vessel nozzles, closures, and bleeder valves. Related products are included. — GRAY TOOL COMPANY, P. O. Box 2291, Houston 1, Texas.

K-23 — Ball Valves — Bulletin TTP-180, 4 pages, describes top-entry, top-adjusting thermoplastic ball valves made of unplasticized polyvinyl chloride or chlorinated polyether for corrosive service. — TUBE TURNS PLASTICS INC., 2929 Magazine St., Louisville 11, Ky.

K-24—Solid Lubricants — Bulletin 124, 24 pages, discusses the theory and practice of lubrication by solids. Describes major advantages of molybdenum disulfide solid lubricants, available in powder form, as greases, resin bonded coatings, dispersions, and special forms. — THE ALPHA-MOLYKOTE CORPORATION, 65 Harvard Ave., Stamford, Conn.

K-25—Supervisory Equipment — Brochure GEA-7043, 8 pages, presents features, dimensions and operating characteristics of new solid-state supervisory equipment for control of remote electrical apparatus. — GENERAL ELECTRIC COMPANY, Schenectady 5, N. Y.

K-26—Pneumatic Conveyors — Bulletin 18-G, 4 pages, describes negative pressure pneumatic conveyors, gives applications and design data as well as a schematic drawing showing complete dimensions. — SPROUT, WALDRON & CO., INC., 130 Logan St., Muncy, Pa.

K-27—Magnetic Gages — Catalog No. 388, 6 pages, covers features, models, construction and operation of liquid level magnetic gages for use where glass and its gaskets cannot be tolerated. — JERGUSON GAGE & VALVE CO., 80 Adams St., Burlington, Mass.

K-28—Speed Reducers — Brochure No. F-2003, 12 pages, gives technical information on shaftmounted geared speed reducers, with illustrations, descriptions, and selection and ordering instructions. — U. S. ELECTRICAL MOTORS INC., P. O. Box 2058 Terminal Annex, Los Angeles 54, Calif.

K-29—Anti-Corrosive Paints—Tech. Bulletins No. 5 and No. 6, 2 pages each, cover heat resistant paints for use where decoration is desired along with chemical and heat resistant properties; and "double coat" paints designed to yield a dry film thickness equal to two standard coats with only a single application. —SUBOX, INC., Fairmount Plant, Hackensack, N. J.

K-30—Automation for Electric Utilities — Bulletin GEA-7044, 24 pages, contains information and scope of the 50-year development of automated equipment and systems for electric utilities. Traces electric utilities' use of automated equipment from the present back to 1910. — GENERAL ELECTRIC COMPANY, Schenectady 5, N. Y.

K-31—Turbine Supervisory Instruments — Bulletin GEZ-3078, 12 pages, includes description and specifications of G. E.'s compact redesign of a TSI system that charts a permanent record of mechanical performance throughout starting and running periods.—GENERAL ELECTRIC COMPANY, Schenectady 5, N. Y.

K-32—Pressure Regulators — Catalog J160-1, 8 pages, gives information on line of sliding gate pressure regulators featuring self-operated, pilot-operated, solenoid operated and back pressure models. — OPW-JORDAN, 6013 Wiehe Road, Cincinnati 13, Ohio.

K-33—Packaged Substations — Bulletin No. 5601-1A, 8 pages, furnishes information on new line of ultra-compact, packaged electrical substations designed to slash overall space requirements and eliminate long runs of low-voltage cable. Units incorporate a transformer plus primary and secondary control and protective devices.—I-T-E CIRCUIT BREAKER COMPANY, 1900 Hamilton St., Philadelphia 30, Pa.

K-34—Submerged Pump Motors — Bulletin No. F-1976, 6 pages, presents a new line of motors for low head submerged pumping, giving design features and illustrated with cross-section drawing and diagrams. Explains operation and applications. — U. S. ELECTRICAL MOTORS INC., Box 2058 Terminal Annex, Los Angeles 54, Calif.

K-35—Vibrating Feeders — Folder 2770, 6 pages, describes Straightline vibrating feeders for high-capacity, controlled feeding of heavy and highly abrasive bulk materials. — LINK-BELT COMPANY, Dept. PR, Prudential Plaza, Chicago 1, Ill.

NEW Product Briefs

. . . there is always a BETTER WAY

Circuit Breakers

V-1 A new line of thermal-magnetic circuit breakers is now available from the **Westinghouse Electric Corporation,** Pittsburgh 30, Pa.

Several frame sizes of the old line have been replaced with a fewer number of newly designed frames which have a wider range of ratings, since engineering advances make it possible to retain the same ratings in a smaller physical size.

The frame sizes of the new line have maximum current ratings from 10 to 800 amperes, and interrupting capacities from 5000 to 50,000 amperes. All frames are rated at 600 volts, except for the size E which is 240 or 277. These breakers have new terminals suitable for either aluminum or copper cable. All of them are listed with Underwriters' Laboratories, and they conform to or exceed NEMA standards.

Relief Valve

V-2 A pressure reducing and relief valve designed for initial pressures of 4000 psi with water, oil, air or gas has been announced by **Atlas Valve Company,** 280 South Street, Newark, N. J.

The 3851 Type F valve, constructed of heat treated aluminum bar stock with bronze and monel trim, is available in ½" and ¾" sizes. The single seated, spring loaded, diaphragm actuated valve has adjustable pressure ranges of 0-1000, 0-2000 and 0-3500 psi.

Features include molded neoprene diaphragm with nylon insertion, push rod for external adjustment of relief feature and handwheel for easy adjustment of reduced pressures. The valve has no stuffing boxes or external actuating connections.

New Product Briefs (Continued)

Segment Bender

V-3 **Greenlee Tool Co.**, Rockford, Illinois, announces the addition of the No. 777 lightweight segment bender for 1¼" through 4" aluminum or steel conduit and pipe. Weighing only 65 lb,

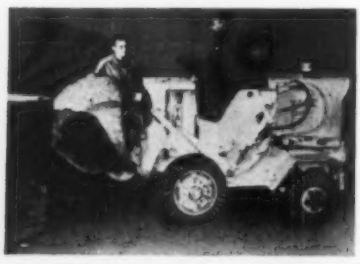
exclusive of shoes, it can be easily transported and operated by one man.

The design of this bender makes it possible, with a few optional parts, to do 90 degree one-shot bending ½" through 2", and thin-wall (EMT) bending ¾" through 2".

The bender is powered by a two-speed, 10,000 psi hand pump, and can also be operated with a power pump. The ram develops 27 tons of pressure for the toughest bending jobs, including extra-heavy schedule 80 pipe.

Resilient Rubber Tires

V-4 Manufactured by the **Notat Tire Co.**, 1504 East 34th St., Chattanooga, Tenn., the tires pictured on this Yale yard shovel are specially constructed of many rubber wedges. Although solid rubber, Notat tires provide the resiliency of pneumatics, but without the disadvantages. There is no tube and no air chamber.

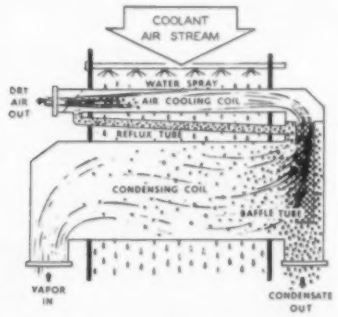


Their construction permits them to run over sharp stone, glass, brick, nails and metal without tire failure.

The tires can be installed on a variety of materials handling equipment. A wide range of standard sizes is available.

Vapor Condenser

V-5 **Niagara Blower Company**, 405 Lexington Ave., New York 17, N. Y., has built a new high capacity vapor condenser operating on the evaporative cooling principle. Capacities of 30 million Btu are available from single units of this type.



Cooling is achieved by the evaporation of moisture on tube surfaces through which the vapor passes. The heat given off from the vapor as it is condensed is transferred to the air stream and is rejected into the atmosphere. Non-condensibles are sub-cooled several degrees and separated from the condensate either by steam ejector or vacuum pump. The condensate is in a closed system, kept pure and completely recovered.

A high vacuum is maintained consistently and economically. Capacity is regulated by dampers which automatically vary the amount of air handled in proportion to the load, removing heat at the rate of input and controlling temperatures.

Vibrating Feeders

V-6 **Link-Belt Company**, Prudential Plaza, Chicago 1, Ill., has incorporated a new principle in its straightline vibrating feeders for ore, coal, rock, shale, slag, and other heavy and highly abrasive bulk materials.

The straightline high intensity feeding motion of the new Synchromatic vibrator mechanism is produced by two unbalanced shafts, each driven by a pancake motor mounted directly on the vibrator frames. The shafts rotate in opposite directions and cause the motors to synchronize despite absence of direct coupling.

The combination of speed, stroke intensity and straightline action results in effective feeding regardless of the type of material being handled. Action of the feeder can be altered by changing the amount of shaft unbalance.

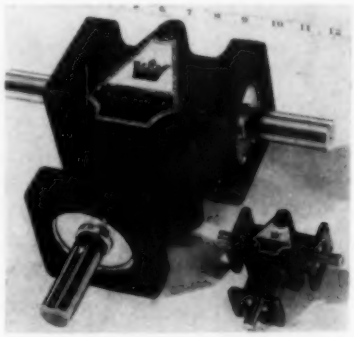
Two models in 30 sizes are available with capacities up to 1350 tph. The feeders are low in first cost, easy to maintain and are shipped as complete units.

Instrument Grease

V-7 **Lehigh Chemical Company** of Chestertown, Maryland is now marketing a synthetic grease engineered for instrument type applications over a temperature range of −75 F to 300 F.

A lithium soap grease, Anderol L-793 has built-in rust protection which makes it a long-life lubricant for precision bearings, pneumatic and hydraulic systems, and all types of precision instruments. It utilizes a medium viscosity diester oil as a base fluid, and features a low evaporation rate.

Completely compatible with ordinary lubricants, the product is penetrating, non-gumming, and remarkably stable. It leaves no harmful deposits on the precision parts. The base oil seeks out metal, clinging to the surface in a film that protects parts from humid and salt conditions.



Packaged Gear Units

V-8 **Crown Gear Division, Harrington & Richardson, Inc.**, Worcester 10, Mass., has introduced a new right-angle heavyweight gear unit. The new model delivers 8 hp at 1100 rpm. Durable construction makes it possible for

(*Continued on page 96*)

New Products

(*Continued from page 94*)

the unit to stand up for long periods with a minimum of maintenance, even under continuous peak loads.

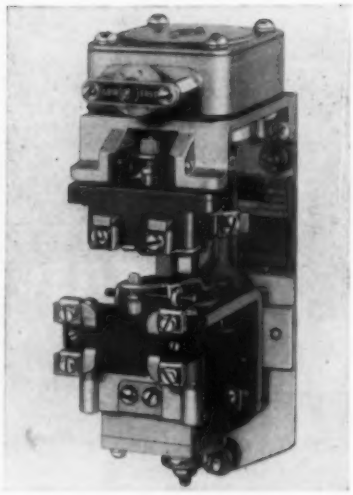
The Model 803 incorporates massive, 8620 hardened spiral bevel gears, double sealed ball bearings, and stainless steel shafts. It has five surfaces to provide flexibility in mounting the aluminum alloy housing. Weight is 18 lb.

Micro-Flow Valve

V-9 **The General-American Valve Company,** Corona del Mar, Calif., announces the Micro-Flow Valve for control of ultra-small amounts of liquid or gas.

With this valve a Cv (flow coefficient) of as low as .003 to zero can be controlled linearly over a stem travel of ⅝ inch. Higher ranges are also standard.

At 5000 psi the valve can be throttled from 3 ccpm to 5 gpm. At lower pressures the valve has been used to deliver as little as 10 drops per hour. Pressure ratings are to 10,000 psi. Clog and vibration resistance are obtained by restricting all flow to a variable triangle-shaped orifice.



Snap Switch Interlocks

V-10 **Square D Company,** 4041 North Richards Street, Milwaukee 12, Wis., announces that as many as two single-pole double-throw instantaneous interlocks can now be furnished on Class 9050 Type C, d-c timers. The timers can be ordered with interlocks factory-installed, or separate interlock kits are available for field installation. Quick-make, quick-break snap action provides increased contact reliability.

The timers have an adjustable timing range of up to three minutes, and can be changed from on-delay to off-delay with a simple conversion kit.

Plunger Pump

V-11 **W. R. Barry Pump Company,** P. O. Box 3051, Tulsa, Okla., is now offering V60 quadruple plunger type pumps in sizes 150 to 1250 hp and pressures from 500 lb to 20,000 lb.

Design features include suction manifold integral with case, precision file hard gears for better tooth contact, short bearing spans to reduce shaft deflection. Gear ratios in the pumps permit direct coupled drives. All threaded valve pot and plunger covers provide easy accessibility for maintenance.

Motion Detector

V-12 A simple, reliable and extremely low cost device for detecting motion or the lack of motion has been developed by the Research Laboratories of **Gaylord Products, Incorporated,** 1918 Prairie Ave., Chicago 16, Ill.

Although designed to "sense" increments of rotary motion as little

as or less than ½ rpm, the device can also be utilized to detect linear motion by a simple conversion to rotary motion.

Completely enclosed in a nylon housing, the device is approximately 2½ inches in height and weighs only

a few ounces. It has virtually frictionless operation, and will perform over a wide temperature range . . . from minus 40 F to over 240 F. The device is not affected by magnetic fields, making it particularly useful in operations where generators are in use, or where electro-magnetic equipment is required.

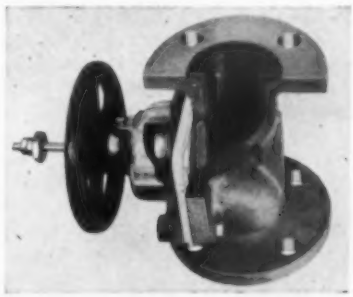
Spacer Couplings

V-13 **T. B. Wood's Sons Co.**, Chambersburg, Pa., is marketing "Sure-Flex" spacer couplings, equipped with special detachable hubs that permit the coupling of shafts spread as far apart as 7½ inches. Spacer couplings may also be removed without disturbing shaft alignment.

Like standard "Sure-Flex" couplings, the spacer type consist basically of two flanges and a two-piece flexible rubber sleeve. The teeth of the sleeve halves lock into the teeth of the flanges without clamps or screws, tightening under torque to provide smooth transmission of power.

Shaft ends fit into the hubs. Each hub is attached to the coupling flange by four cap screws.

To remove coupling from the shafts, simply unscrew the four cap screws in each hub. This allows the central flange-and-rubber-sleeve section to be lifted out. Restoration of the coupling to the shafts is as quickly effected.



Diaphragm Valves

V-14 A new 8" flanged-end Penton-lined packless diaphragm valve has been announced by **Hills-McCanna Company**, 4600 West Touhy Ave., Chicago 46, Ill.

The new valve is available with a cast iron or aluminum body and with a wide variety of diaphragm materials. It costs less than solid Penton or various corrosion-resistant metal valves but provides comparable or superior resistance to a wide range of chemicals. (Penton, a chlorinated ployether, which combines high chemical and temperature resistance with excellent dimensional stability, is a product of Hercules Powder Company.)

Typical applications include on-off and throttling control of acetic acid, butadiene, hydrofluoric acid, lubricating oil, natural gas, orange juice, sodium cyanide, sulfuric acid, zinc sulfate, and many other liquids and gases.

Oil Cutouts

V-15 Two new oil cutouts, with applications for load switching and overcurrent protection, have been announced by the **General Electric** Lightning Arrester and Cutout Section, Pittsfield, Mass.

A new 15-kv oil cutout, rated 200 amp, has a 7000 amp interrupting capability. The 15-kv cutout is less expensive, lighter, and smaller than

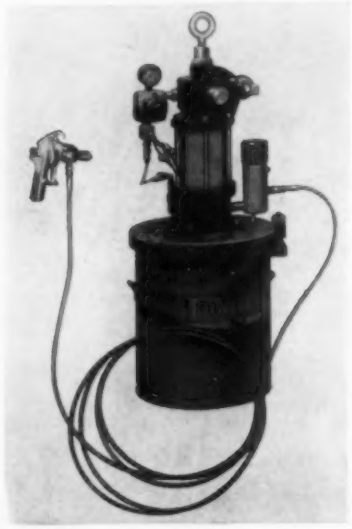
(*Continued on page 98*)

New Product Briefs (Continued)

any other oil cutout of a similar rating on the market.

A new 7.8-kv cutout, rated 200 amp, has a 5,000 amp interrupting capability. Replacing a lower-rated 7.8-kv cutout, it incorporates improved components and thus is unchanged in exterior dimensions.

In addition to standard metal enclosed oil cutouts, special assemblies are available to meet specific requirements.



Airless Spray Gun

V-16 The versatility of airless spray painting, particularly the handling of materials with varying viscosities and fluid flows, can be obtained with a minimum cost unit now available from **The DeVilbiss Company,** Toledo, Ohio.

The new model uses the same pumping unit as other DeVilbiss airless equipment and the same spray gun. It includes a refillable, 10-gallon tank with clamp-lock lid, pressure control regulator and gauge, air motor driven agitator, filter and positive air shutoff valve.

Firebrick

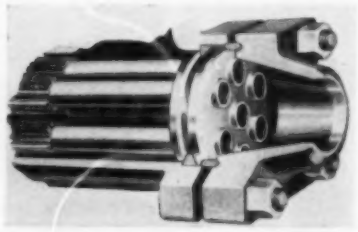
V-17 **The Babcock & Wilcox Company,** 161 E. 42nd St., New York City, is marketing three new lines of firebrick recently developed by the company's Refractories Division in Augusta, Georgia.

The new high temperature firebrick are applicable in the metals, petroleum, cement, chemical and glass industries. They are classified as the KAO-HB high burn superduty; the KAO-60, which is 60 per cent alumina; and the KAO-70, a 70 per cent alumina firebrick.

Coagulant Aid

V-18 A new group of coagulant aids has been announced by **Dearborn Chemical Company,** Chicago, Ill. Known as "Aquafloc," they cause individual particles in water to gather in the form of dense flocs. As the solids become larger, heavier masses, they settle faster, filter better and give better water clarity. Used either alone or with standard coagulants, these new coagulant aids reduce treatment costs while improving results. Included in the product series are a highly effective non-ionic coagulant aid; one which may be used in potable water systems; and another which has an anionic form that produces excellent results when floc is positively charged.

All products in the series can be handled without special precautions. They remain stable in storage for a period of at least six months. Since extremely low quantities of these coagulant aids are required for normal applications, they are exceptionally economical to use.



Heat Exchangers

V-19 **The Brown Fintube Company,** 300 Huron St., Elyria, Ohio, has developed a new multi-tube double pipe heat exchanger to be used in high capacity applications.

Prior to the development of this unit, for some duties it has been unfeasible economically to use double pipe sections because of the number of units required. However, the Brown thermodynamics laboratory, by engineering a bundle of finned tubes to one individual section, has substantially increased the capacity of a single hairpin so that high ca-

pacity applications are readily met.

In sizing new installations, engineers are now able to replace as many as four conventional double pipe sections with a single multi-tube unit, a substantial savings in the cost of heat exhanger equipment.

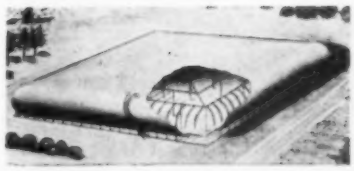
Industrial Fence

V-20 **Firmaline Products of Crompton & Knowles,** Midland Park, N. J., is manufacturing a corrosion resistant, non-conductive, fire retardant fencing, composed of continuous strands of glass rovings and polyester resins. Durable and long-lasting, this new fencing is rat-proof and has no moisture pick-up (maximum moisture absorption .05). It does not require paint and eliminates maintenance and replacement costs.

Standard thickness is ⅝ inches on 1 inch center. Present standard size is 30" x 80", but the fencing is also manufactured to specification. Weight is 1/3 pound per square foot, fiberglass tensile strength — 125,000 psi. Pigmented resins make possible endless color variations and can provide safety colors and color coding. It can be cut by tinsnips, hacksaw and hand-powered tools.

Storage Tank

V-21 A new-type water storage tank is shown in this sketch of the "Cylindroid," a low-cost, ground-level, high-capacity reservoir developed by **Graver Tank & Mfg. Co.,** East Chicago, Ind., Division of Union Tank Car Company.



The Cylindroid is designed to meet the need for a low-cost reservoir which can be built to any capacity to serve present and future requirements.

The tank provides approximately 16% more storage capacity than comparable cylindrical tanks. It also costs less to build, because it makes possible the use of lighter steel; requires a minimum of shop forming and prefabrication; can be erected on the site with a small crew and light equipment; fit-up is all straight line and welding is all down-grade.

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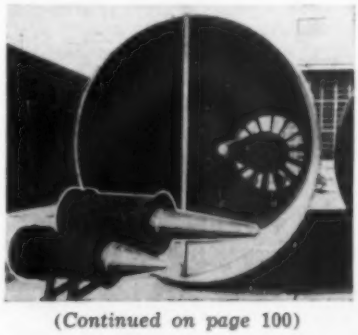
See Pages 87 & 88

Fans and Blowers

V-22 **Benson Manufacturing Company,** Commercial Blower Division, Kansas City, Mo., has incorporated new engineering features in its line of axial flow fans and blowers, including blading similar to that used on jet aircraft engines.

These new blade designs give high performance and efficiencies that cannot be attained by conventional three or four bladed propeller type fans. Advantages over centrifugal blowers include reduction of floor space requirements, reduction in sheet metal work at assembly, less noise, easier installation, long life with low maintenance.



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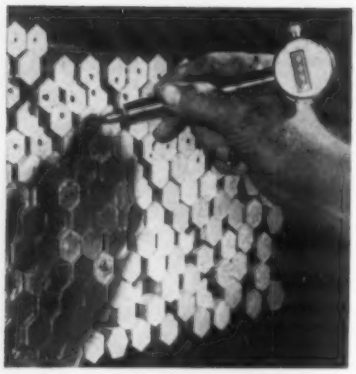
New Product Briefs (Continued)



Industrial Counter

V-23 **Van D. Mark,** P. O. Box 44, St. Clair, Mich., manufacturer of production and inventory controls, is offering the "Mark Counter," a device designed to reduce time and errors in taking physical inventories, counting stock received, and items for shipment. It is also useful for counting in-process items at the inspection bench.

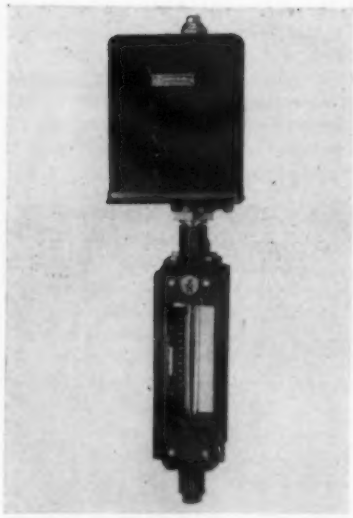
Operation is simple. Each time a piece of material is touch with the counter pen tip, it leaves a small spot of ink and the counter clicks once. As a result, the ink spot readily identifies each item counted, and the counter dial shows the exact number of items. Pens can be changed for color coding.

Alarm Rotameters

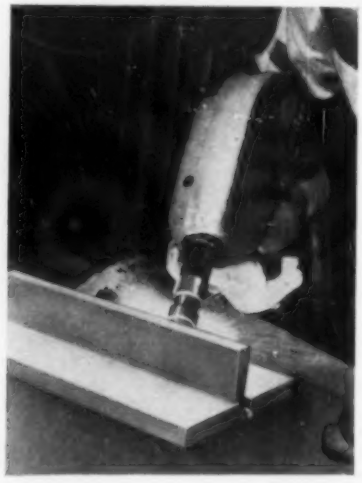
V-24 A new line of Alarm Rotameters made by the Instrument Division of **Schutte and Koerting Company,** Cornwells Heights, Bucks County, Pa., is designed to measure fluid rate of flow and to indicate abnormal high or low flows.

The instruments can be made to activate a warning light or alarm device, and will start or stop a pump, motor, or control unit.

A typical unit consists of a standard 5 inch scale glass tube or metal tube Rotameter and a sensing system which is mounted above the Rotameter in a weather-proof extension housing.



Either one or two sensing devices are set for flows desired. When flows are within the range desired, the encapsulated magnet in the extension rod will rise or fall with the float but will do so in the range between the sensing devices.



Arc Welding Unit

V-25 New manual Aircomatic (gas-shielded metal-arc) welding "MIGet" gun and controls have been developed by **Air Reduction Sales Company,** 150 E. 42nd St., New York 17, N. Y.

It is designed for use in light to heavy fabrication where numerous short welds, off the ground welding, or emergency repairs are necessary.

The gun carries its own compact reel of wire, wire feeding drive rolls, and complete-range wire speed control in the gun itself. The operator can weld as far as 50 feet away from the control panel.

News of the South-Southwest

(*Continued from Page 32*)

Westinghouse Expands S. C. Plastics Facilities

A major program for expanding and modernizing production facilities for decorative plastic laminates is under way for the Micarta division of **Westinghouse Electric Corporation.** When completed in late 1961, the expansion will increase capacity of the division's Hampton, S. C., plant by about 75 per cent. G. H. McBride, manager of the division, has indicated that cost of the program will be in excess of $2,000,000 and that to house the new equipment, the division is adding 40,000 square feet of manufacturing space to the 540,000 square feet already available.

The expansion includes installation of a new 6,000-ton, high-pressure laminating press capable of producing five by twelve foot sheets of decorative laminated material in both universal and standard grades. The entire press system will be served by special equipment for automatic press loading, conveying, and unloading. Other new equipment includes a four-zone treater capable of impregnating five-foot-wide material with resin, drying it, and cutting it to size.

Record Production for Goodyear at Houston

A record four billion pounds of synthetic rubber has been produced by **The Goodyear Tire & Rubber Company's Houston, Texas** plant.

The final billion pounds of Plioflex rubber in this milestone achievement was produced in only 23 months; by contrast, nearly seven and a half years was required to turn out the plant's first billion pounds.

To obtain a billion pounds of natural rubber in a two-year period, 500 rubber plantations of 2,000 acres each, with an average annual yield of 500 pounds per acre would be required.

The plant, world's largest synthetic rubber facility, began production in October, 1943. It was one of four Goodyear operated for the government during World War II. The company purchased the plant in 1955 and expanded its capacity to 245,000 long tons a year.

One of the Houston plant's significant contributions to the synthetic industry was the pioneering and development of a continuous production method, that permits around-the-clock production.

Consultants — Greensboro, N. C.

The firm of Patrick B. Comer, industrial psychologist, became Patrick B. Comer Associates when Robert A. Englander of Lynchburg, Va. recently joined the organization. The group specializes in the field of management consultation with general offices in Greensboro, N. C.

E. S. Dulin Retires from Byron Jackson

E. S. Dulin retired from **Byron Jackson** in September after 31 years of leadership. Mr. Dulin was president of the company from 1929 to 1958 and has also served as chairman of the board since 1945.

Byron Jackson, manufacturer of centrifugal pumps for power generation and other industrial services, became one of the major divisions of the Borg-Warner Corporation in 1955.

(*Continued on page 102*)

Southern News Briefs

(*Continued from Page* 101)

In its 88-year history of operation, Byron Jackson has had only four men as chief executive officers. Mr. Jackson was followed by John B. Keating in 1913. Andrew W. Rose, elected to succeed Mr. Dulin in 1958, cited Mr. Dulin's record of management as "a tremendous measure of this man's deep pride in Byron Jackson and his determination to 'never let down' the employees, customers, and investors who made BJ a respected trademark throughout the world."

Mr. Rose pointed out that Ned Dulin led the company through two crucial periods of the company's growth — the critical depression years and the challenging reconversion and diversification eras after World War II.

Mr. Dulin is also a director of a number of other major California industries and will maintain an office in the Statler Center Building.

U.S.I. Div. Doubles Houston Plant Capacity

A new section of **National Distillers' U.S.I. Division** polyethylene production plant at Houston, Texas, has gone on-stream. This installation doubles the capacity of the plant, according to Dr. R. E. Hulse, executive vice-president of National Distillers and Chemical Corporation, and general manager of the U. S. Industrial Chemicals Co. Division.

In early 1959, the Houston plant started up with a 75 million pound annual capacity (soon increased to 100 million). This new expansion brings plant capacity up to 200 million pounds. Within recent months the company has developed and introduced a new produce-bag resin, a new paper coating resin, three new blow-molding resins, a new cast film resin, and two high-flow blending resins.

Yuba Acquires Oklahoma Plant

Yuba Consolidated Industries, Inc. has acquired Coynco Products, Inc., Tulsa, Oklahoma. The operation will be known as the **Yuba-Tulsa Corporation,** a subsidiary of Yuba Consolidated Industries, Inc.

The Tulsa plant will be expanded and developed into a major manufacturing center for Yuba's shell and tube and air-cooled heat exchangers,

used by the petroleum, petro-chemical and chemical industries. Plant area will be increased some 30% by the addition of new bays. Two new railroad sidings will be added and new craneways constructed. New machinery will be added to further diversify the plant's production capabilities.

Safety Record for Chemstrand — Fla.

The Chemstrand Corporation's nylon plant at Pensacola, Fla., celebrated the completion of two full years without a lost-time injury recently, Fred G. Gronemeyer, Vice-President and Director of Nylon Manufacturing, announced. During a period of 731 days, plant employees worked a total of 26,189,132 safe hours.

Chemstrand's nylon plant first won national recognition for its safety consciousness when it received the National Safety Council's Award of Honor, highest accorded by the group, for completing 3,000,000 safe man-hours during the period from August 4, 1955 to January 6, 1956.

Since that time, the plant and its employees have won the Award of Honor eight times. In addition, in 1956, 1957 and 1959 they were cited by the State of Florida for having the best safety record in the history of the state.

Nylon plant employees broke their own world's safety record for the textile industry of 17,106,185 man-hours without lost-time injury last year and have been adding to it continuously since that time.

Georgia Power Wins National Safety Award

First place in a nationwide safety competition among 22 of America's major electric utility companies has been awarded to the **Georgia Power Company.** The National Safety Council, sponsor of the annual contest, said the award was given in recognition of the power company's outstanding safety record during the past year. In this period, company employees worked 10,502,085 man-hours without a fatal accident.

The power firm recorded 15 disabling injuries in 1959, establishing a frequency rate of 1.43 as compared to 4.35 for the industry as a whole. The frequency rate is determined by multiplying the disabling injuries by one million man-hours and dividing the results by the total man-hours worked.

(*Continued on page* 104)

Southern News Briefs (Continued)

NMA Meeting — Atlanta

The National Management Association will hold its annual convention on October 19 in **Atlanta, Georgia,** at the Dinkler-Plaza Hotel. Theme of the 37th Annual Convention is "Your Place in Management's Expanding Horizons."

One of the highlights of the convention will be presentation of an award to Thomas L. Martin, chairman of the board of the Alabama Power Company, NMA's Management Man of the Year, at a banquet held in his honor Thursday evening, October 20.

Armco — Baltimore

Robert W. Martens has been appointed assistant manager of the Eastern Division of **Armco Drainage & Metal Products, Inc.** He will continue to be located at Baltimore, Md., where he was formerly division sales manager. Before his appointment to the Eastern Division in 1953, Mr. Martens had been Virginia State sales manager since 1944.

Datamatic — Ga., Tex.

Among ten new sales offices that have been opened by **Datamatic Division of Minneapolis-Honeywell** are the offices in Atlanta and Houston. The opening of these offices is part of a broad program for expanding and strengthening the field operations of Datamatic's Marketing Division, in stimulating sales and providing top-level service to companies planning to install electronic data processing systems.

Addresses and personnel of the new offices are: **Atlanta**—1415 Howell Mill Road; Joseph L. Richardson, sales representative. **Houston** — 5440 Gulf Freeway; Clifford M. Keddie, sales representative.

S. T. Walz

Square D — Southeast

The appointment of S. T. Walz as manager of the Southeastern Region has been announced by **Square D Company.** In his new capacity, Mr. Walz directs the manufacturing operations of the Atlanta assembly plant as well as heading all Southeastern marketing activities. His previous experience with Square D includes several years in the Birmingham office, where he served as branch manager and later as district manager.

Leonard Murrans

Leonard Murrans, who had been manager of the company's Charlotte, N. C., office since 1957, has been transferred to Atlanta as sales manager of the Southeastern Region. Mr. Murrans, a graduate of Georgia Tech, had also been with the Birmingham office at one time.

G. E. Service Shop — Fla.

Richard R. Meredith has been named manager of the **General Electric Company's** Apparatus Service Shop at 1062 East 28th Street, Hialeah, Florida.

Mr. Meredith, who succeeds Rich-

ard R. Evans, Jr., is a veteran of 21 years of service with the company. Starting as a motor assembly worker, he advanced steadily through a variety of positions in the shop, became a general foreman in 1945 and service sales engineer two years later.

Atlas Valve — Kansas

Atlas Valve Company, Newark, N. J., manufacturer of automatic pressure, temperature and level controls for industry, announces that Harry McPherson, Dwight Building, Kansas City, Mo., has been appointed as a sales representative. Mr. McPherson's territory includes the State of Kansas.

Packaged Air Preheater At Chlor-Alkali Division

The **Chlor-Alkali Division of Food Machinery and Chemical Corporation** recently installed two new completely packaged Ljungstrom air preheaters to recover waste heat from boiler exhaust gases in a chlorine processing plant at South Charleston, W. Va.

The pre-assembled units manufactured by the **Air Preheater Corporation,** Wellsville, N. Y., will service two 110,000 lb/hr boilers which have been completely overhauled and modernized.

Selection of the packaged Ljungstrom was based on low installation cost, ease of assembly, the compact size of the unit, and on the performance record of similar packaged units purchased in 1957.

Operating on the continuous regenerative heat recovery principle, the packaged preheater recovers heat from furnace exhausts and transfers it to incoming cold air, thus boosting efficiency of the cycle about 1 per cent for each 40 F of heat recovered.

At the rated load, 8,300 sq ft of effective heating surface in each unit will recover approximately 300 F, which would normally be wasted. The revamped boilers will each generate 110,000 pounds of steam per hour while operating at a total steam temperature of 700 F and a pressure of 425 psi.

The Chlor-Alkali Division, one of the world's largest producers of chlorine, manufactures a broad line of basic industrial and specialty chemicals for a wide variety of manufacturing processes. Principal products are chlorine, carbon bisulfide, carbon tetrachloride, caustic soda, caustic potash, and soda ash.

Robertshaw — Texas

Robertshaw Aeronautical & Instrument Division announces the appointment of Wright Industrial Products Co., 5738 North Central Expressway, Dallas 6, Texas, as sales representative serving Central Texas and the Gulf Coast.

W. L. Cowley, W. N. Wright, and R. W. Starrett of the Dallas staff are available to discuss customer needs for process controls, level controls, and vibration malfunction detection switches.

Oakite — Miami

Charles W. Pearce has been appointed technical service representative in Miami by **Oakite Products, Inc.,** manufacturers of industrial cleaning and metal treating compounds.

A graduate of Asbury College, Mr. Pearce was formerly a material and process engineer for the Douglas Aircraft Company. He completed an intensive eight-week training program at Oakite's New York laboratories and in the field before undertaking his new assignment.

General Electric — Mo.

A new sales office serving insulation needs of electrical and electronic manufacturers, repair shops and utilities in the Central States has been established by **General Electric.**

David M. Bradfield, with headquarters at 2375 Hampton Ave., St. Louis, Mo., will represent G. E.'s Insulating Materials Department in Missouri, Kansas, Arkansas, Louisiana, Oklahoma, Texas and Southern Illinois.

The Department handles a broad line including mica products, coated materials, insulating paints, varnishes, wire enamels and irradiated materials.

(*Continued on page* 106)

Southern News Briefs (Continued)

Lewis-Shepard — Mo.

The appointment of Landon B. Atkins as exclusive sales and service representative in the St. Louis, Missouri territory has been announced

by **Lewis-Shepard Products, Inc.**, Watertown, Mass., producer of electric fork lift trucks and related materials handling equipment.

New and complete sales and service facilities will be maintained at Atkins Industrial Equipment, Inc., 5240 West Florissant, St. Louis 15.

Sutorbilt Corp. — La.

Gregory-Salisbury and Company, Inc., 820 Julia St., New Orleans, La., has been appointed a representative of **Sutorbilt Corporation** in Louisiana, Mississippi and Arkansas.

Gregory-Salisbury, with a staff of 26, maintains branch offices in Baton Rouge, La.; Jackson, Miss.; Pine Bluff, Ark., and Memphis, Tenn. It specializes in the sale of electrical and mechanical equipment to the industrial, utility and electrical construction market.

Sutorbilt designs and manufactures a comprehensive line of positive displacement blowers, vacuum pumps and vapor compressors.

G-E Seeks Oldest Carrier-Current

General Electric Company, this year marking its 40th anniversary in the power-line carrier-current field, has been conducting a nationwide search for its oldest equipment in operation today.

Carrier-current being used by electric utilities in four different product categories — telephone sets, pilot relay sets, coupling capacitors and line traps — has been sought.

The winning utility in each category will receive from G-E, as an award for the oldest unit, the Company's present functional equivalent, incorporating the newest advances in the field. The old equipment, when replaced, will be offered by G-E for permanent museum display.

General Electric, oldest company in the carrier-current field, began manufacturing pioneer equipment at Schenectady in 1920. The Communication Products Department at Lynchburg, Va., today makes products for every carrier communication requirement.

Cooper-Bessemer — Tex.

The appointment of Harvey B. Cox, Jr. as a sales engineer in the **Cooper-Bessemer Corporation's** Houston branch office has been announced.

Mr. Cox was formerly associated with the Clark Brothers Company in Houston. He is a Petroleum Engineering graduate of the University of Houston.

Goulds Pumps — S.W.

W. H. Plowman, Manager of Southwest sales for **Goulds Pumps, Inc.**, is now permanently located in Houston, having moved there from Tulsa where he has been for the past several years. Mr. Plowman's address is 5739 Portal Drive, Houston.

Georator Corp. — Va.

The Georator Corp. announces that its former Geophysical Instrument Co. Division is now a separate corporation, Geophysical Instrument Co., Inc. The company will maintain its offices, laboratory and manufacturing facilities at 315 Tudor Lane, Manassas, Va. Its line of manufacture will include electrical exploration instruments of types the firm has developed over the past 26 years.

The Electric Products Division will be abolished and all future products produced under the name of Georator Corp.

Subox — Missouri

Subox, Inc., recently announced the appointment of Williams & McKinley Sales Co., 1344 Wilton Lane, Kirkwood 22, Mo., as sales representatives in eastern Missouri and greater St. Louis.

Williams & McKinley Sales Co., 417 Grand Ave., Kansas City, Mo., has been appointed representative for western Missouri and Kansas.

Pennsylvania Crusher—Mo.

George O. Thompson has been named District Sales Representative, St. Louis territory, for the **Pennsylvania Crusher Division,** Bath Iron Works Corp. He has been with the division since 1957.

Mr. Thompson's headquarters are at 9703 Holiday Gardens Drive, Apt. D, St. Louis, Mo.

Diamond Alkali — S.E.

Appointment of Charles P. Egolf to Assistant Manager of **Diamond Alkali Company's** Southeastern Sales Office in Memphis, Tennessee, has been announced.

Mr. Egolf has a background of 14 years' experience as a salesman and research chemist. He joined Diamond in 1953.

Ross Engineering — Ala.

J. O. Ross Engineering Division, Midland-Ross Corporation recently announced plans for the opening of a new sales office in Mobile, Alabama, headed by R. C. MacDuffee, an experienced salesman and a mechanical engineering graduate. Mr. MacDuffee joined the Ross organization in 1953, after a short tenure with the A. O. Smith Corporation.

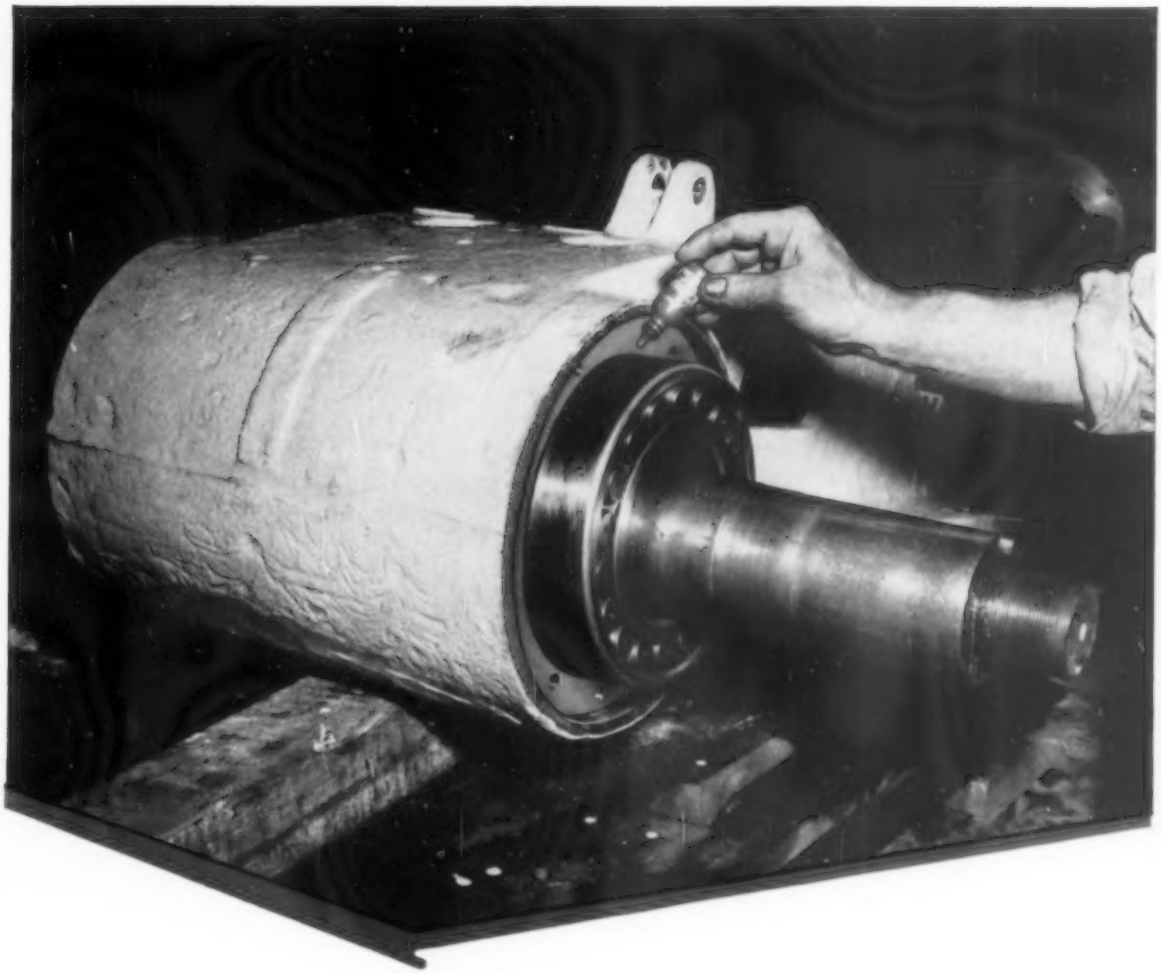
Union Steel — S.W.

Robert M. Feighl has joined **Union Steel Corporation** as Southwestern Representative and will be located in Houston, Texas. He will cover a four state territory including Texas, Louisiana, Oklahoma, and Arkansas.

Mr. Feighl is a graduate of the University of St. Thomas.

Index of Advertisers

This Advertisers' Index is published as a convenience, and not as a part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.



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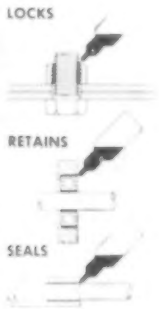

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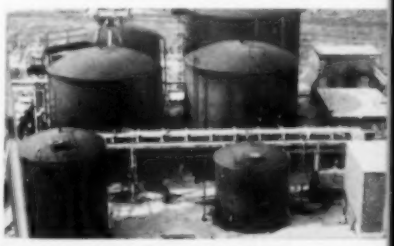
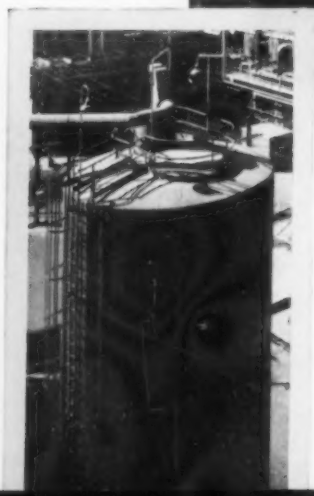
Seal Kote being applied to liquid chemical tank cars.



Seal Kote and K Kote on conveyors, pipe, tanks.

Seal Kote on Horton Spheres to prevent corrosion.



K Kote on soap and black liquor tanks at pulp mill.

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